The Builder.

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Wind Pressures on Buildings.

IT has for some time past been recognised that certain time-honoured formulæ much used for calculating the effect of wind pressures on surfaces—such as roofs of buildings — inclined at an angle to the direction of the air currents, are not to be depended upon, and that a larger margin of safety than was formerly considered necessary is advisable when using them. One excellent reason that pressures are in excess of those calculated is that the reduction of pressure on the leeward side has not been sufficiently allowed for, the action of induced currents not having been so well understood, or, at any rate, so generally recognised when these formulas were constructed as they are in the present day. So far as we are aware Mr. Horatio Phillips, an experimenter whose work in this direction has not received the acknowledgment it deserves, was the first to draw attention to the rarefaction of the atmosphere on the leeward side of a hill or roof-like structure, and we well remember some years ago witnessing experiments of his which not only proved the fact but gave quantitative results. Since then other investigators have pursued the subject. The latest addition to our knowledge on this question has been supplied by a Swedish experimenter, Mr. R. Irminger, who has recorded the results of his investigations in the form of a paper, published in the *Ingenioren* of Copenhagen, and a translation of which may be found in the Library of the Institution of Civil Engineers.* The experiments were made with models, and though some correction might be necessary in applying the results to larger planes, yet the results clearly indicate that the question of wind pressures on roofs requires reconsideration.

As is pointed out, experiments on wind pressure have been usually made by means of an apparatus in which the body subject to pressure revolves under the influence of the moving current. Mr. Irminger proceeds on the more exact method of causing the air current to impinge on the surface when stationary. This was the method formerly pursued by Mr. Phillips, who, however, obtained an induced current by means of steam jets, whilst Mr. Irminger has recourse to an opening in a tall chimney. In this was inserted a horizontal wooden tube 9 in. by 4½ in. in section. Experiments were made with inclined planes, prisms, spheres, cylinders, pyramids, and cones. The planes were each represented by two thick iron sheets placed one-tenth of an inch apart, and their edges connected all round, thus forming a shallow closed box. Holes were bored in both surfaces, and these could be plugged at will. The pivot on which the plane swung was a pipe leading to the interior of the box and having a pressure-gauge on the end. In this way any increase or reduction of pressure on either surface of the box-like plane could be ascertained.

A plane 4½ in. by 1½ in., and occupying the full width of the tube, was tried at various angles of inclination and with four velocities of air. When the plane was at an inclination of 5 deg. to the direction of the wind the percentage of the total pressure which was produced on the leeward side of the plane was 100 at all velocities of wind tried, and the total wind pressure was 23 per cent. of what it would have been had the plane been normal to the air current. By "pressure on the leeward side of the plane" is meant the pressure on the leeward sheet of iron. This pressure would naturally be in the direction of the wind, and would be caused by the reduction of atmospheric pressure on the opposite side, due to rarefaction. At an inclination of 10 deg. with an air velocity of 49·5 ft. per second, the proportion of total pressure on the leeward side was 82 per cent., and at 31 ft. per second the pressure on the leeward side was 91 per cent. The proportion of total wind pressure at this angle, as compared to the same area of normal plane, was 45 per cent. At 40 deg. inclination of the plane, and with a velocity of 49·5 ft. per second, 65 per cent. of the total pressure was due to the leeward side; at 31 ft. per second it was 70 per cent. The proportion of pressure as compared to the normal plane was 75 per cent. at this angle. At 90 deg. inclination of the plane, and 49·5 ft. per second of air current, the proportion of total pressure due to the leeward side was 56 per cent.; at 31 ft. it was 59 per cent., and at this angle the total pressure was equal to that which would have been sustained had the plane been vertical or normal to the current. We have, for the sake of brevity, selected only a few typical instances contained in Mr. Irminger's tables, and the figures as to the proportion of pressure as compared to normal planes are averages of a larger number of experiments than we quote.

The plane referred to, having its ends touching the sides of the box, may be considered as a plane of infinite length. Mr. Irminger tried a similar series of experiments with a plane 2 in. shorter—viz., 2½ in. by 1½ in. At 5 deg. inclination the results were similar to those obtained with the larger plane at the same inclination, excepting that the proportion of total pressure as compared to the normal plane was but 12 per cent. At 10 deg. inclination also the whole of the total pressure was due to the leeward side, but the pressure was 26 per cent. of that due to a normal plane. At 40 deg. inclination and 49·5 ft. per second air current, the proportion of total pressure due to the leeward side was 78 per cent.; at 31 ft. per second it was 74 per cent., and the proportion of total pressure compared to the normal was 74 per cent. At 90 deg. inclination, and 49·5 ft. per second, the leeward effect was 48 per cent. of the whole; at 31 ft. per second it was 46 per cent. of the whole. The total pressure at this angle, as with the other plane, was equal to that of a normal plane.

These figures are extremely interesting; and it will, we think, be somewhat of a revelation to many persons to find how much influence the reduction on the leeward side has upon the necessity for strength in structures having to withstand wind pressures. It is not, however, with single planes (the box referred to was so shallow that it has been considered as a plane) that the architect and engineer has so much to deal, as with more complex structures comprising several planes, and here also Mr. Irminger supplies us with useful information, from which we can quote but a few details. By a series of experiments on long prisms placed with their axes at right-angles to the wind the effect of rarefaction on solid bodies is shown. The total pressure (57 per cent. of which was due to rarefaction) on a long plane of a given width s, placed normally to the wind, and of the same length as the prisms, is taken as a standard, and is denoted by p. In a prism, the section of which was a square of side s, with the wind parallel to the side,

* See also Minutes of the Proceedings Inst.C.E., Vol. cxviii.

the total resultant pressure in the direction of the wind was 0·95 *p*., the proportion due to rarefaction being 43 per cent. In a similar square turned so that the wind was parallel to the diagonal the total resultant pressure was 0·79 *p*., with 76 per cent. rarefaction. With the section a circle of a diameter *s*, the total resultant pressure was 0·57 *p*., the percentage due to rarefaction being 72. In another series of experiments made with a sphere, it was found that only that part of the surface within 35 deg. of the diameter parallel to the wind's direction was subject to positive pressure from the wind, the remainder of the surface having its pressure reduced by rarefaction ot the air. Returning to the experiments with prisms, a rhombic cross section presenting an angle of 60 deg. to the wind, the length of side being *s*, showed a total resultant pressure in the direction of the wind 0·25 *p*., 82 per cent. of which was due to rarefaction; a section, an equilateral triangle, side *s*, gave 0·59 *p*. total resultant pressure, with the wind parallel to the side, and 0·42 *p*. when the apex was presented to the wind; in the former case the proportion due to rarefaction being 42 per cent. and in the latter 86 per cent. When the prism was turned so that the base was presented to the wind the total resultant pressure was 0·71 *p*., the percentage due to rarefaction being 37. It will be noticed here that in shapes with which the percentage due to reduction of pressure on the lee side is greatest the total resistance is least, but in no case quoted does what may be called the rarefaction ratio fall below 37 per cent.

Further experiments were made with other forms. A cube with the wind striking it parallel to the edge showed a total resultant pressure in the direction of the wind of 0·80 of total pressure on a disc equal to the face, the percentage due to rarefaction being 22 per cent.; with the wind parallel to the diagonal of the face the pressure was 0·66. A cylinder of a height equal to its diameter received a pressure of 0·47 of that which would have been exerted on a square disc equal to a section through the axis, the rarefaction ratio being 50. A pyramid of square base with a side equal to the height gave, with the wind parallel to the side of the base, a pressure of 0·78 of that which would have been exerted upon a disc equal to a maximum section perpendicular to the wind; with the wind diagonal to the base the corresponding percentage was 55. In the former instance the rarefaction was 37 per cent., and in the latter 55 per cent. Lastly, with a cone in which the height equalled the diameter of the base, the resultant pressure was 0·38 of that due to a disc equal to the maximum section perpendicular to the wind, 50 per cent. of the total pressure being due to rarefaction.

We have not space to follow up these results by practical applications. Experiments were made with models representing buildings of various forms. Generally it was found that the effect due to rarefaction on the lee side was quite as important a factor as the actual wind pressure on the windward side. To take an instance quoted of a roof of 45 deg. pitch, the wind blowing at right-angles; the normal pressure sustained by the lee side of the roof, due to rarefaction, was over three times that due to wind pressure on the windward side; the resultant pressure being upward. On the windward side the pressure was found greatest near the lower edge, and, diminishing uniformly, became negative near the ridge. In the case of a model representing a gas-holder with a segmental spherical roof the pressure on the roof was entirely outwards, and the resultant nearly vertical.

We have not thought it necessary to describe the ingenious manner by which Mr. Irminger obtained his records of pressure, or to dwell upon other details of the manner in which the experiments were carried out. These, as well as much other interesting information, may be found in the original, and would well repay careful study.

THE COUNTY COUNCIL ELECTION.

THE approaching County Council election is a matter of serious importance to the inhabitants of London. It means that by the force of that election they empower certain persons to govern the Metropolis and to spend the money of the ratepayers for the next three years. With anything in the nature of political questions we have no concern, but some of the matters upon which the coming election will turn have from time to time necessarily been commented on in these columns. It is desirable, therefore, to refer briefly to some of the points which have been touched on in the recently-issued statement of policy of the "Moderate" party.

The first of these which requires some notice is that which is concerned with the Works Department of the Council. Now, on this we have had something to say from time to time, but we have carefully guarded ourselves against either condemning or approving it without sufficient data. For the first thing to be borne in mind in regard to it, is that it in no way involves a question of principle. "The Progressives have committed the Council to the policy of executing all its work without the intervention of a contractor." Herein lies the mistake of the Progressive party. They regard it as a question of principle: they consider that a municipal body ought to do its own work, whereas it is a question purely of expediency. If the County Council can do its own building and constructive work, with a department of its own, at a less cost to the ratepayers than by employing a contractor, then there can be no doubt whatever that it should adopt this system. If, on the other hand, it is less costly to employ contractors, then that is the plan which a businesslike body will use. When the Moderates say that the undertaking of works on a large scale by the Council involves "the establishment of extensive and costly plant and staff which must always be kept occupied to justify their existence," they have hit a weak spot in the present programme of the existing Council. For it is quite possible that so far as regards a particular piece of work it may appear to cost less if executed by the Council than by a contractor. But at the same time this may be a mere fallacious economy, since after the work is completed the staff and plant have to be maintained, and the cost thereof when added to the cost of a particular work may make such work more costly to the community than if a contractor were employed. But the Moderates go further than this—they say that the actual work as now performed is more costly than it should be. "Particulars of all the works executed for the Parks Committee have been given in a recent report, which shows that while those done by contractors have cost 6 per cent. less than the estimates, those carried out by the Works Department have cost 36 per cent. more. The only houses as yet erected by the Department are those in Poplar and Greenwich. It has been stated in the Council, and not contradicted, that the approximate cost of these buildings shows an excess of 7,000*l*. over the passed estimate." We do not adopt these figures, they may or may not be correct; but they are sufficient to make the people of London demand that the Council shall investigate the question, and shall not, as the Progressives desire to do, go on with the Works Department without considering if its existence is justified. Now the policy of the Moderates on this point is reasonable and businesslike. It is "to place a limit on the extent and character of works to be undertaken directly by the Council, and to insist on a profit and loss account being established, and provision being made for reports by independent experts." The Moderates are willing that the Council should execute works which it is clear can be done by them at a profit to the community. They are opposed to the Council executing all their own work, by their own Works Department, regardless of cost. No reasonable man can doubt that this is the proper policy, and that on this point alone the Moderate candidates should be supported by the ratepayers of London. To see that numerous and costly works are properly carried out in the Metropolis is one of the main duties of the County Council, and it is an essential element of it that there should be such a supervision as a prudent man of business would give to his own concerns. No prudent man will build a wall by the hands of his own workmen if by so doing it costs him more than it would to employ a builder. The same principle must actuate a municipal body as a private individual, and it is because on this point the policy of the Moderates is sounder than that of their opponents that they are entitled to the support of the people of London.

Coming next to the head of improvements. It is the policy of the Moderates "to undertake without delay such improvements as are admittedly necessary in the public interest, seeking powers by a proper system of recoupment to secure for the ratepayers the benefit of increased value imparted to neighbouring land by the improvements." It has been one of the errors of the policy of the present majority of the Council that they have allowed year after year to pass by without taking in hand urgently-required improvements, simply and solely because their pet idea of "betterment" could not be allowed by Parliament. That system has nothing objectionable in it in principle, but it is most difficult to carry out in practice. The Progressives, had they been actuated by a reasonable business spirit, would have put the betterment question on one side, and have carried out the required improvements without it. Here, again, the policy of the Moderates is more reasonable and business-like than that of their opponents.

Upon the water question the policy of the Moderates is not so satisfactory. They desire to obtain evidence that the acquisition of the undertakings of the present companies will not be more expensive to the ratepayers than the present system, and failing such evidence to obtain more control over the companies. This is rather a half-hearted policy. It is desirable, we feel no doubt, that the supply of water should be in the hands of a public body, though not necessarily of the County Council, and it should be the aim of the Moderates to formulate some scheme for the purpose. While in this respect the policy of the Moderates appears to be wanting in comprehensiveness and to display some want of foresight, it is preferable to that of the Progressives, which appears to be to buy out the water companies without having sufficiently considered all the circumstances of the situation. The subject is really one for the Government; it is too great to be left in the hands of any body of men. It requires financial skill, public foresight, and great business ability, and we trust that the next Government which comes into office will take this matter out of the hands of the County Council and other local bodies, and will introduce and carry through a comprehensive scheme for the supply of water to the Metropolis, which will settle the matter for many years to come. The points on which we have touched are those most within the range of our criticism, and we have not hesitated to express a plain and unbiassed judgment on them. It is for the ratepayers of London to carry out our advice by action at the polls.

If it be objected that this advice is based on views of these questions only, we would add that the want of businesslike capacity exhibited in regard to them has been shown in other matters. Instead of doing the best with their existing powers, the present majority in the County Council has sought to misuse their powers and to absorb the

Corporation of the City. Instead of giving a fair wage for a fair day's work, the Council has looked rather to the interests of their workmen than to those of the inhabitants generally of the Metropolis. In one word, they have acted rather as doctrinaires than as men of business, and it is men of business whom London requires to carry out its local government efficiently.

NOTES.

THE new building connected with the Banqueting House in Whitehall, now the museum of the United Service Institution, has been open for inspection this week. As far as the hall itself is concerned, little beyond the necessary cleansing and painting has been done, except the introduction of incandescent electric lamps and the provision of a system of fire defence. The floor under the main hall, formerly used as a cellar for coals and lumber, has, however, been transformed; the windows have been opened out, the naked brick vaults plastered, and the lower portion wainscotted with the oak panelling taken from the chapel fittings above, thus forming an admirable resting-place for the heavy exhibits, guns and such like, which are admitted on a level with Whitehall-gardens. At the levels of the lower gallery of the hall, and of the upper galleries, doors of communication connect the old building with the new one, which comprises on the ground floor a spacious entrance-hall, porter's room and clerk's office, and members' lavatories; also at the back, facing Whitehall-gardens, a large lecture theatre capable of seating 400 people, with a lecturer's room in connexion. The theatre has a separate exit towards Whitehall-gardens. On the main floor, at the level of the Banqueting Hall, there is a council room and secretary's room facing Whitehall, and a loggia overlooking the theatre at the back, which occupies two stories in height. On the first floor there is a large newspaper-room, the whole length of the Whitehall front, and a reference library over the theatre, accommodating about 30,000 books, also a librarian's room. On the second floor, being the level of the Banqueting Hall gallery, there is a large writing-room to the front, while the top floor is given up to a large topographical room and caretaker's quarters. In the basement is the boiler-room and storage cellars. The building externally is faced with Portland stone, which experts believe to be the same bed as the stone for the Banqueting House. Care has been taken not to interfere with the main lines of Inigo Jones's work. Internally the walls have been lined with Parian cement painted a cream colour, the enrichments to doors and windows harmonising with the style of the exterior and contrasting well with dark mahogany woodwork. Many of the fireplaces have been brought from the old Institution in Whitehall-yard, which was designed by Sir John Vanbrugh as a residence for himself. These are good specimens of their age. The architects for all the works are Messrs. Aston Webb and Ingress Bell, and the total cost has been about 25,000*l*. Illustrations of the new buildings were published in this journal, under date May 13 and September 16, 1893. The façade of the new building is a very graceful piece of architectural design in itself, but we have some doubt whether it might not have been a better scheme to have carried on the cornices and order of the Banqueting House on the same scale, making a break in the line of front and modifying the details a little, so as to avoid any appearance of an attempt to confound new work with old. The whole effect would have been more homogeneous. As it is, we have two façades on different scales, forming parts of what is now practically one building. It is a point, however, on which there is no doubt room for difference of opinion.

AT the last meeting of the Berlin Archæological Society an account was given by Herr Pomtow of the excavations at Delphi. From the report issued in the *Berliner Philologische Wochenschrift* of January 26 we extract some particulars so far as they relate to the main topic of interest—*i.e.*, the great temple of Apollo. It cannot be said that the results are so far encouraging. The platform on which the temple is built has now been almost completely laid bare, and, with the exception of the northern angle, still covered with *débris*, the excavators have dug right down to the living rock. No single fragment of the metopes or frieze, not so much as a "little finger" of the pediment figures, has come to light, and scarcely a single characteristic architectural fragment. The conclusion is almost inevitable that the temple was at some time or another systematically robbed of its sculptured decorations. As Pausanias saw and briefly described (x. 19, 4) the pediment groups, M. Homolle conjectures, not unnaturally, that the despoiler was some emperor of later date. Herr Pomtow reminds us that there was at Constantinople a hall called Delphæ, in which "the Delphic columns" stood, and though this primarily, perhaps, refers to the great serpent column, it is quite possible that Constantine the Great played the part of Lord Elgin to the temple marbles in general. Another important though negative result has been arrived at. Herodotos (v. 62) expressly states that the "Alcmæonidæ being wealthy men made the façade of the temple of Parian marble instead of as originally intended of ordinary poros stone. With the exception of one triglyph discovered 2 in. down in the foundations no fragment of this Parian restoration has been found, and of the unfinished tufa capitals found no single one can, as regards the form of either abacus or echinus, be referred to a time as early as the sixth century, B.C. M. Homolle concludes and supports his view by various inscriptions that there was another much later restoration of the temple unnoted by any literary author and not known to Pausanias. Pausanias believed himself to be examining the temple designed by Spintharos (x., 5, 13). The ground-plan of the temple cannot yet be determined, the intercolumnal spaces even, and as yet, the number of the columns remain uncertain. It must be remembered, however, that there is still hope at the northern angle, the more so, as it was a piece of the *northern side* of the cella-wall that Ulrichs saw above ground on his third visit to Delphi in 1841. The main point established is the exact position of the *adyton*. This must be placed not as has often been conjectured in the opisthodomos but in the very middle of the cella itself. The pavement is here intercepted by a broad, deep depression, the walls of which are of good masonry, carefully finished, evidently intended to be visible. The hollow is at present filled with a miscellaneous collection of all manner of fragments—of vases, of statues, blocks of tufa, &c. When these are sifted and examined, important data may be looked for. The underground chambers reveal a complicated network of spaces, two mètres high, intersected by corridors. There is no means of approach by steps—they are empty, and bear no trace of having been used for human occupation. M. Homolle considers that the myth of "underground treasuries" must be entirely abandoned. More details are promised shortly.

THE German Emperor has notified his intention of erecting a number of monuments to the Princes of Brandenburg, commencing with Margrave Albert, and ending with King William I. Room is to be found for them in the Avenue of Victory, which is one of the main approaches to the new Houses of Parliament. The cost will be defrayed from the Emperor's privy purse, and the monuments are to become the property of the Municipality of Berlin. The occasion for this gift was the Emperor's birthday, on Saturday last. It is novel indeed to find royalty augmenting the usual birthday honours list, in which the names of artists so seldom appear, by a present of sculpture which will at least find work for a large number of this body, and will be an exceedingly popular kind of thank-offering on the occasion. Berlin citizens are very proud of their town; public monuments are much appreciated; and a row of sculptured monuments in one of Berlin's finest avenues will atone for much. One is, however, curious to learn whether the commissions for the work are reserved for court favourites only.

IN the course of a conference on "Conciliation and Arbitration in Industrial Disputes," at the Toynbee Hall, on Tuesday, Mr. F. Maddison paid a high tribute to the value of existing conciliation boards, and to that connected with the London building trades in particular. This was spoken of as a pattern to be copied by other industries desiring to establish a practical system for dealing successfully with trade disputes. The folly and futility of strikes become increasingly apparent both at home and abroad, and many a dispute can be pointed to in which the adoption of conciliatory suggestions at the outset would have resulted in gain to both parties, the apparent success achieved by the victors being entirely discounted by the losses involved. In addition to this, the injury done to the body politic is, as Mr. Maddison pointed out, simply incalculable. Obstinate refusal to submit to arbitration—whether on the part of employers or employed—is to be deprecated; but the non-existence of suitable machinery for conciliation is sometimes partly accountable for this attitude. A complete system of conciliation boards would certainly render it less frequent and more reprehensible. The question of legislation upon this subject is a very difficult one, but there can be no doubt as to the desirability of putting some well-considered scheme into practical shape without loss of time in those industries in which no provision is yet made for this most sensible method of dealing with trade disputes.

THAT the heating of a London theatre by electricity should have become an accomplished fact has taken engineers by surprise. Messrs. Crompton & Co. have to be congratulated on the success of their arrangements for heating the Vaudeville. They employ four large radiators, which can easily be carried about and placed where required. The County Council allow no door between the stage-door and the stage, hence the stalls are often in a bath of cold air, although the upper parts of the house may be uncomfortably warm. Radiators placed in the stalls during the daytime and removed to the sides in the evening are found very efficient; the freedom from danger and the ease with which the temperature can be regulated being great advantages. The total cost is under 2s. an hour. Eventually, heating-plates will be placed along the skirting of the walls with suitable gratings in front of them. It is expected that these, with the portable radiators, will be sufficient to warm the theatre in the coldest weather. In special cases, heating by electricity can be employed with manifest advantage, although heating with steam, by means of the radiator system, is generally far cheaper. It certainly does not give the same scope to the architect for inventing beautiful and novel effects.

MESSRS. MACEVOY & HOLT are not disposed to admit the inertness of coarse cement-grains. They have replied to Mr. Redgrave in the *Times*, and to Mr. Bamber in *Engineering*, and in both cases they mention again the experiments to which they had alluded in their letter of January 7.

They do not see, apparently, that the *three* tests on which they base their opinion are not enough to throw discredit on the conclusions at which many engineers have, after hundreds of experiments, arrived. Even if it be allowed that Mr. Bamber over-stated his case when he said that the residue on "a 180-mesh sieve . . . . is no better than so much sand, if as good," it does not follow that Messrs. Macevoy & Holt's statement is any nearer the truth. And their sarcastic references to Mr. Redgrave's pertinent question (whether in their experiments "the coarse particles of cement were really freed from all flour by careful washing?") were quite uncalled for, seeing that Mr. Redgrave did not mean washing in water, as they seemed to think, but in benzine or other liquid "not liable to set up any cement action." All this talk about the inertness of coarse grains is, however, beside the mark; the real issue is the effect of ragstone on Portland cement, and this is clearly kept in view by Mr. J. L. Spoor in his letter to last Friday's *Engineering*. He gives an interesting table of tests made "years ago . . . . by an unbiassed expert"; among which are the following:—

Age in days	7	28	90	365
	lbs.	lbs.	lbs.	lbs.
Neat Portland cement	657	732	806	826
1 part cement + 3 sand	199	253	337	359
90 parts cement + 10 fine sand + 300 standard sand	133	217	316	320
90 parts cement + 10 limestone + 300 standard sand	154	196	311	311

These experiments go to show that limestone [Mr. Spoor does not say how finely it was ground], added to cement, is a source of weakness, although its enfeebling effect is not as great as that of fine sand. Mr. D. B. Butler's letter is also to the point, and tends to corroborate Messrs. Macevoy & Holt's statement made at the Cannon-street meeting. Samples of cement, containing a considerable addition of Kentish rag, "which have"—to use Mr. Butler's own words—"reached me for testing in the ordinary course, compare favourably with average English cements when tested with three-parts of standard sand. I have also found, in the course of my experiments, that an admixture of Kentish rag tends to make the mortar cohere better during the operation of filling the moulds, and if a more compact briguette is thus obtained, a higher tensile strain would naturally result. This may perhaps account, to some extent, for the improved results claimed by Messrs. Macevoy & Holt." It is to be hoped that the question will soon be settled by the report of the Cement Section of the London Chamber of Commerce.

THE Municipal Buildings, Perth, of which the greater part, with the valuable contents, were destroyed by fire last week, were built about fifteen years ago, from the designs of Messrs. A. & A. Heiton, of that city. The elevations were faced with freestone from Bonfield Quarry, in Fife, the internal stonework being from the local Huntingtower Quarries. Erected, at a cost of about 11,000*l.*, on the site of the old Council Chambers and some adjoining property acquired by the Police Commissioners, and having frontages to Tay- and High-streets, the block comprised offices for the Police, the Registrar, and the City Chamberlain on the ground floor; and on the first floor a council-chamber, 41 ft. by 25 ft., a burgh court-room, 30 ft. by 22 ft., and the Burgh-Assessor's office. It is stated that the flames broke out in an overheated flue, and that some portraits and busts, with all the town maps and plans, have been consumed. Perth received a municipal constitution forty years ago, and was made a city in 1880. We published a view of the Municipal Buildings, with a plan of their first floor, on September 25, 1880.

CANALETTO'S painting of the interior of the Rotunda, at Ranelagh Gardens, Chelsea, has just been purchased for our national collection. It is one of the three pictures he is known to have painted of Ranelagh, and was engraved by N. Parr in 1751. The view is of intrinsic interest, as it depicts the original orchestra (octagonal on plan, and supporting the flat roof), after its conversion for a fireplace, and the later orchestra which, with the organ, was built over one of the four entrances. The Rotunda was built for Wm. Crispe and Jas. Myonet by William Jones, architect to the East India Company. With an exterior diameter of 185 ft., it had a rusticated arcade on the ground floor, and over that a gallery, with a roof sloping to the clearstory. There were four entrances, in the Doric style, their pediments rising to the base of the top story. The interior diameter was 150 ft.; forty-eight open boxes—Walpole calls them "little ale houses"—stood around the ground level, over them was a gallery, and above that the clearstory, lighted by sixty round-headed windows. The flat ceiling, coved at its edge, was groined over each of the windows and the eight sides of the central orchestra which rose in two stages. Canaletto shows each "box" fitted with a table and chandelier, two circles of large chandeliers suspended from the roof, a sounding-board over the orchestra, and plain wooden benches, without backs, for the visitors. The Gardens had belonged to the house which Richard, first Earl of Ranelagh, and Paymaster-General to the Forces, designed and built for himself, 1690, by Chelsea Hospital, he having obtained from the Crown two leases of about 23 acres, at a total rent of 45*l.* 11s. 6d. per annum, which in 1698 was exchanged for a grant in fee at an annual rent of 5*l.* An Act of 1730 vested the estate in trustees; three years later the house and grounds were disposed of in lots; two builders, Timbrell and Swift, bought the greater portion for 3,200*l.*, and gave a lease to Lacy, patentee of Drury-lane Theatre, and Solomon Rietti, who proposed to convert the garden into a kind of winter Vauxhall. They abandoned their project; Myonet and Crispe, lessees, revived it, and opened the Rotunda on April 5, 1742. Walpole writes to Mann in that year, "The building and disposition of the Gardens cost 16,000*l.*" The "Etna" stood to the south, in that part which was watered by a lake and a canal fed by the Westbourn. Ranelagh reached the acme of its fame in the interval 1775–85, during the patronage of the Duchess of Ancaster and Georgiana, Duchess of Devonshire; Dr. Burney was organist in 1760; on June 29, 1764, Mozart performed some of his own pieces on the organ and the harpsichord; in May, 1767, the Catch Club gave their first entertainment, for which Arne composed the choral and instrumental music. Their popularity having waned, the Gardens were finally closed on September 9, 1803 (*teste* Diprose), and the buildings having been pulled down in the following year were acquired by the Government for an extension of the hospital grounds. The organ, by Byfield (1746), was removed to Tetbury Church, co. Gloucester. The "Old Men's-ground," south-east of the pensioners' grave-yard, represents the old Gardens; the centre of the Rotunda stood over a spot that lies 350 yds. due north from the riverside end of the broad walk leading to the central front, which faces south-east, of Chelsea Hospital. Ranelagh House, afterwards connected with the Rotunda by a covered way, is drawn in La Cave's "Perspective View of the Amphitheatrical Building . . . to be erected at Chelsea, designed by Wm. Jones, archt., 1748." That view seems to be a design for altering, or rebuilding, the original structure; it shows the central orchestra rising by a lantern and cupola through a large circular opening in the roof, and the latter raised by a further story. La Cave had engraved Jones's adopted designs in 1742.

AS we have repeatedly commented, in very decided language, upon the unjust and illiberal conditions often offered to competing architects, we have pleasure in calling attention to the terms of the competition for the Technical Institute and Public Library for West Ham, as advertised on another page of this issue. The Council offer three large premiums (250*l.*, 150*l.*, and 100*l.*), and they state that the architect to whom the first premium is awarded will be engaged to carry out the building on terms in accordance with the Institute Schedule of Professional Practice and Charges of Architects. A deposit of one guinea is to be made on application for a copy of the instructions, but this will be returned on the return of the documents within a month, if the applicant decides not to compete; so that, while the deposit is sufficient to prevent applications from idle curiosity, architects are given the opportunity of inspecting the instructions without irrevocably forfeiting the deposit fee. The most important point, however, is the recognition of the right, which we have insisted on for years, of the first premiated architect to be paid his full commission for carrying out the building, in addition to and apart from the amount of the premium. His claim to this ought to be obvious, inasmuch as the competition drawings are extra work, and can never be used as working drawings; but this is almost the first time we have seen it practically admitted in an important competition. It is to be hoped that, the example having been once given, it will now be followed in other cases. The Council of the County Borough of West Ham, who are the promoters of the competition, have appointed Mr. MacVicar Anderson as assessor.

LETTER FROM PARIS.

IT seems highly probable that the preparations for the 1900 Exhibition will cause, in two or three years, the demolition of the Palais de l'Industrie; the selection of the design by M. Hénard for one of the three first premiums seems to indicate a decided move in that direction, of which no one will complain except the "Société des Artistes Français," which for several years will be in some difficulty as to the location of its annual salon.

M. Bouvard, the architectural director of the future Exhibition, is commencing the study of a definite scheme, which will consist of a kind of selection of the best points of the various premiated designs; and it is probable that the site of the Palais de l'Industrie will be occupied by a large avenue, nearly at right-angles to the Champs Elysées, opening towards the Esplanade des Invalides, and having the dome of the Invalides as the close of its perspective. This avenue, crossing the Seine on a wide bridge planted with trees, will recall to old Parisians the former Carré Maringny, where, up to 1853, before the building of the Palais de l'Industrie, military reviews alternated with public *fêtes*. This transformation will add much to the effect of the grand promenade, at present encumbered with so many varied erections. According to this plan moreover—which is not yet finally adopted—the Palais de l'Industrie will not altogether disappear—it will only change its direction and its architectural disposition. Instead of being parallel with the Champs Elysées, it will be at right-angles with it, having its principal façade along the new road, on the site at present occupied by the "Palais de Glace" and the "Jardin de Paris."

The Municipal Pavilion on the Champ de Mars will also probably disappear, and the Municipal Council, which will be expected to make a large contribution to the exhibition funds, will obtain instead a monumental building, also on the line of the new avenue, and forming a pendant to the reformed Palais de l'Industrie. Here the Municipal Administration will be able to arrange its artistic collections under much better conditions as to space, comfort, and security, than in the Pavillon de la Ville, that last remnant of the Exhibition of 1878.

One result will be that until the new arrangements are complete the Pavillon de la Ville will only be used as far as is necessary; while at the Galliera Museum, on the other hand, everything is being done that can be done, and it will probably be open to the public in a few months.

The view and the plan of this museum have already been published in the *Builder* (Jan. 6, 1894);

...ce then the building and its internal decoration ...e been completely finished. In the entrance ...estibule, where there is to be a bust of the ...enerous donor, the smaller works in marbles ...ve been arranged.

From this we enter a large gallery, in which ...e already placed the finest tapestries belonging ...o the city. Large glazed cases, which will ...emselves be objects of art, designed by some of ...r best sculptors, will contain vases, enamels, ...ttery work, wrought-iron and pewter work, ...c., purchased from the annual salons. In an ...joining gallery the public will be able to see, ...r the first time, a fine collection of stained-glass ...indows of the twelfth and thirteenth cen...ries, besides cartoons for windows, bearing ...e signatures of Besnard, Lerolle, and Hippo...te Flandrin. Another large gallery will be ...evoted to Gobelins tapestry, marbles, and ...eramics. In other adjoining rooms will be ...llected the medals, old engravings, and smaller ...bjects of art, with which the collection ...ill, year by year, be enriched. The square in ...ont of the building will itself serve as an ...ditional museum of contemporary sculpture.

This evening (Saturday) the first grand ball of the year will take place at the Hôtel de Ville, and will form a sort of inauguration of M. Puvis de Chavannes' decorations of the grand staircase. This decoration, of clear but subdued colour, with rather a predominance of blue, harmonises perfectly with the white stonework and lights up well under the electric light. It is a real repose for the eye after the eccentric performances in the adjoining rooms, where artists of essentially different temperaments and opposite talents seem to do battle with each other without the slightest consideration for unity of decorative effect. Two new marble statues are to be seen, which complete the sculptural decoration of the state dining-room. One, by Chapu, represents "Le Bé," and was left unfinished by the lamented artist; it has been completed under the direction of M. Paul Dubois. The other is the work of M. Dalou, and represents "La Chanson." There are further decorations to be carried out. M. Roll is at present completing an immense composition, intended for the entrance-hall opposite to that which has been decorated by M. Puvis de Chavannes. M. Jules Chéret is to have a whole room next to the Salon de Caryatides turned over to him, in which he intends to paint the principal characters of Italian and French comedy; M. Forain is to paint scenes of every-day life in the Council refreshment-room; and in the "Salon Diplomatique" it is proposed to have over the mantel a large allegorical bas-relief representing the City of Paris, surrounded by figures symbolising Instruction, "Assistance Publique," the Arts, and the Sciences.

Two small exhibitions have opened. That of the Cercle Volney comprises about 200 pictures and some busts; and though it is not therefore an important exhibition, it contains some works worth mention. Portraits are the most numerous class of works, those by M. Carolus Duran and M. Benjamin Constant being the principal attractions, but M. Bonnat's portrait of Dr. Labbé is, to our thinking, superior to any of them. M. Bouguereau's "Baigneuse" will add little to his reputation. Two pictures by M. Olivier Merson, "Chant du Soir" and "Les Disciples d'Emmaus," are worth notice for their quality of sentiment; M. Luminais' "Pirates Normands," an Eastern scene by M. Pasini, and "Dunes Flamandes," by M. Tattegrain, have also special interest. Among the sculpture we need only mention M. Boucher's "La Rève" and a bust by M. Puech.

The "Aquarellistes" have also opened their seventeenth annual exhibition at the Georges Petit Gallery. They do not make any progress, and the former exhibitions were superior to the present one. They show mainly a collection of miniatures, laboriously finished with the point of the brush. M. Lhermitte is a happy exception, his washed drawings (rather than water-colours) are fine and broad in style. M. Rochegrosse, who is always in the path of eccentricities, has been endeavouring to give extra effect to his drawings by a system of singular metallic-looking reflected lights. The hand of M. Harpignies, in his landscapes, is not enfeebled by age, and landscape art is also well represented in the works of MM. Paul Lecomte, Luigi Loir, Gaston Béthune, Yon, and Zuber. When we have mentioned also the cats of M. Lambert, the soldiers of M. Worms, the sea-pieces of M. Courant, and the eternal cardinals of M. Vibert, we have sufficiently indicated the general character of the exhibition.

We may mention also an exhibition of water-colours by M. Gaston Guignard in the Rue Caumartin; that of the pupils of the Atelier Cormon at the Durand Ruel Gallery, and that of the drawings and etchings of M. Van Ryssel-berghe at the same gallery.

A new sculpture-room, to be called the Coysevox Gallery, has been opened at the Louvre, adjoining the Puget Gallery. A certain number of works of the seventeenth century are there collected, which offer great interest to the student of French sculpture, showing its development during the little-known period from the end of the sixteenth century to the time of Louis XIV. Many of these works were already in the Louvre, but M. Courajod, the curator, thought they should be shown in a better light; others came from Versailles and from other State repositories less known to the public. We are thus able partly to reconstitute, in the Louvre, the former museum got together by Alfred Lenoir, of works saved from the vandalism of the Revolution.

M. Rollard, the sculptor, has been commissioned to restore the groups of sculpture in stone which decorate the tower of the church of La Trinité. These groups, the work of Maillet, Crank, Cavelier, and Carpeaux, have long been in a state which made them a danger to the public, and attention ought to have been directed years ago to their preservation; but in anything that concerns a church the Municipality of Paris show a systematic indifference. The statues on the tower of St. Germain l'Auxerrois, which are in a dilapidated state, are also to be taken in hand shortly.

At the Ecole des Beaux-Arts MM. Bernier, Thierry, de Gisors, Lalou, Lambert, and Esquié, have been appointed as the supplementary jury to decide on the next competition in architecture for the Prix de Rome. The Caylus prize in sculpture (for the best study in expression of a head) has been awarded to M. Auban, pupil of M. Falguière.

THE ADVANCEMENT OF ARCHITECTURE.*

BY PROFESSOR AITCHISON, A.R.A.

IN my two former courses on the Advancement of Architecture I treated of the benefits Architecture conferred on the people at large, by its power of stimulating thought and of raising various powerful emotions. I drew attention to the sort of immortality architectural monuments gave to a country, and how such monuments, when genuine, presented us with a gauge of the acquirements, knowledge, skill, and aspirations of the people at the time they were built; and I also mentioned the lessons such monuments might possibly give to future ages. I pointed out how desirable it was that architects should endeavour to give to their works the flavour of the age in which they live, which could not be properly given if their works were essentially copies of the works of former ages or of different climes. I gave you some suggestions of how I thought some of that flavour might be given by making buildings more exactly fitted to their uses, by the greater scientific knowledge exhibited in their construction, and by architecturally expressing the uses to which the buildings were put. I told you that architects created organisms in emulation of Nature, and that they should emulate her in giving the proper character to each building; that to express the true character of each building, rather than to produce beauty, should be the architect's aim, for beauty was appropriate only to certain classes of buildings, while the proper character was to every class and to every building. I also said that the impressions made on us by the insides of buildings were largely due to their lighting. That all the architectural decoration of buildings, beyond their shape and openings, was given by mouldings. I hope I impressed on your minds that mouldings must be as carefully studied for their effect in this misty and sunless climate as the Greek mouldings were for a clear air and a brilliant sun, at least, if we were ambitious of rivalling Greek excellence. And I finally told you what additional character and human interest could be given to buildings by the sculptor's, the statuary's,† and the painter's art.

Pure architecture is music without words, and the figure-groups of the sculptor or the painter supply the words. I may add that the painter, besides giving us his conceptions like the sculptor and the statuary, gives us colour too, for he is pre-eminently the master of colour. Our buildings are not only perfected by colour, but can also be greatly helped by it to express their proper character, that is, by the keys of colour used; for different emotions are evoked by the key being light, delicate, gorgeous, sombre, or funereal.

Few persons think that the products of such fine arts as sculpture, painting, music, and literature are self-created, or are even created by those who pay for them; but this is not the case with architecture; its products are mostly written of as if they made themselves, or were designed by the occupiers. The assumption that buildings designed themselves provoked that retort from the wit that "Architecture was the last stronghold of spontaneous generation."

The architectural students know too well that an architectural work is no more self-created than a statue, a picture, an oratorio, or a poem, but that it is the outcome of the thought and personal effort of one who has mastered the teaching of former buildings. As Chaucer says*:—

"For out of the old fieldes, as men saithe,
Cometh all this new corne from yere to yere;
And out of olde bookes, in good faithe,
Cometh all this new science that men lere."†

Almost every one of the fine arts pre-supposes a taste for it in the people, for as the first office of a fine art is to impress or to delight, why should it be produced if it does not? The artists who produce it expect money, honour, or fame, and hope to get all three. I said almost every one of the fine arts, for I did not include architecture, for this fine art apparently gives no delight to the present generation, and produces neither money nor honour, but we hope it may ensure fame. This statement may seem a paradox, for architects are paid. Architecture, however, is not a pure fine art, but is a useful art as well. And the fine art is inseparably bound up with the building as the soul with the body. The fine art of sound is called music, the fine art of architecture is æsthetics, but as architecture is so often used in opposition to building as the *fine art*, I suppose I had better conform to the modern usage, and music can no more exist without sound than architecture can without building. People above the lowest savages must have buildings for shelter, for privacy, and for defence, and that part is paid for, but the architect gives the fine art. I may say, by the way, that architecture never will be thought anything of until it is highly paid for; in the present day, at least, the value of everything is what it will fetch: yet the giving away the fine art will not defraud the architects of fame, should posterity think their works are worthy of fame. These lectures, however, are given in the hope of putting you in the way of getting Fame's good graces, and not those of Plutus. No one would deny that Milton had got a crown of fame, and yet, as Mark Pattison said, he was paid the price of waste-paper for his "Paradise Lost."

Many known factors go to the production of fine architecture, and probably many that are unknown. There must be accumulated wealth, and a desire to expend it on buildings for use, for state, or for the expression of gratitude or adoration, and, as a rule, it is only for the last purposes that the noblest and finest architecture has been produced; there must be great skill in the workmen for the fashioning of the various materials required; there must be science, knowledge, ingenuity and skill amongst the architects, by whatever name they may be called; and they must be animated, too, by a desire to embody the aspirations or ideals of the time: these aspirations pervade society, just as electricity pervades the air. There must be, too, a feeling of delight and gratitude in the people when they see any approach, even the faintest, to the embodiment of their ideal. This ideal, too, must persist for several generations with but slight variation, but with a strong desire for its perfect realisation.

We may look upon the particular ideal of the time as a plant that at first just peeps above the ground, gradually reaches its full growth, blossoms, seeds, and then fades away. The teaching of each successive generation of architects must be founded on the immediate past, though this teaching may be so modified by the study of work done even thousands of years before, that the new architecture may have little apparent affinity with the immediate past. The architects who are embodying this ideal when it is in progress must have mastered the knowledge and skill that has carried it so far, and by study, effort, and genius must keep pace with it.

Of whatever else we may be ignorant, we

* Being the first Royal Academy Lecture on Architecture this Session. Delivered on Monday evening last, Jan. 28.

† A statuary is a worker in bronze.

* "Assembly of Foules." (We believe the authenticity of this poem is questioned by Chaucer scholars, but it probably belongs to his time.—ED.).

† Lere—*i.e.*, learn.

cannot be ignorant of this persistence of an ideal, for architecture has shown this persistence in all its great epochs. We see it in Greek architecture, in Roman, in Byzantine, in Saracenic, in Romanesque, and in Gothic.

No one can doubt that we have accumulated wealth, that we have most skilful workmen, architects learned in all the architecture that has preceded them, and striving to embody their own ideals; for every day we see something new that surprises us, and we occasionally see some unostentatious little building that shows a mastery of delicate proportion.

One of our great wants is a National ideal that can be expressed by building, or an ideal common to Christendom tinged with national peculiarities; another want is an efficient desire to have it expressed:—Gothic is an instance of the embodiment of an ideal common to such races as had embraced Latin Christianity, with the exception of that doorway to the Maristan of Kalaun at Cairo, which we suppose was like a piece of Indian or Saracenic work imbedded as a curiosity in a modern European building. This age not only has a passion for science, but an admiration and respect for it: for besides what the applications of science have done for us materially, there is a belief that science will eventually unfold for us all the mysteries of Nature. The age, too, has been characterised by a passion for exploration, and this passion has not only succeeded in settling questions that had perplexed mankind for thousands of years, but has led to the colonisation of a large part of Africa; and has thus freed Europe from the vague terror of being subjugated by the blacks. This exploration has mainly been done by Englishmen, I might almost say wholly, as the names of Park, Bruce, Beak, Baker, Speke, Livingstone, and Stanley will testify. The cause of the rise of the Nile was the problem I spoke of, and it has been definitely settled as due to the fall of rain in the higher parts. This solution has always been suspected, although Herodotus rejected it. Besides the exploration of the Dark Continent, some of the nations of Europe have tried to arrive at the North Pole, and when this has been reached the South Pole will probably be explored before we have the next flood.

There are, too, visions of many Utopias in the air—the Utopia of universal learning, of universal peace, of moderate labour, plenty and leisure for all; and the democratic Utopia. I do not think there is any Utopia of virtue now in the air, and, as far as I know, there is no modern moral philosophy. This is curious, as everyone must know that nations only come to predominance through virtue, and sink into oblivion when they lose it. The Mediæval Utopia of virtue was theological.

The one great social achievement of the day in England has been universal compulsory teaching, and nothing has been so full of promise since the abolition of the monastery schools. When a chemist wants to get substances to combine, he makes solutions of them, and mixes the solutions, and then the molecules that love each other the most, combine. The youthful humanity in the Board School somewhat resemble these solutions, for the school, with its varied studies, gives the youth of both sexes the chance of taking up with the useful study or occupation he or she likes best, and when there are endowments for perfecting those that show aptitude, we shall have the talents of the country properly trained and applied. No one can doubt that this would be a great advantage both to the country and the individual; it would, in fact, be the carrying out of Napoleon's axiom, "the tools to those who can use them."

There is, however, one important subject that has been overlooked in the Board School teaching, the systematic exercise of the children of both sexes under trained teachers; by systematic I mean that every muscle in their bodies should be daily put in action. If this were done, it would make a stronger, healthier, and a finer race; not to speak of its importance to the bulk of the children, who will have to get their living by hard work. It was the universal practice of gymnastic that made the Greeks so fine in form, and it was mainly from the Greek statues of the winners at the games, that our ideals of human beauty have been formed.

Aristotle tells us that from the Lacedemonians being the first to practise gymnastic, they were superior to all other people, and then says:—"This pre-eminence was due not to their disciplining their youth in this severe manner, but solely to their giving them a course of training, while other nations did not."

As to universal peace, that is a dream that Nature gives no countenance to, for fighting and destruction are her means of preserving the best, and getting rid of the worthless. Tennyson put this very well. He says, man trusted that love was

> "Creation's final law—
> Tho' Nature, red in tooth and claw,
> With ravine, shriek'd against his creed."
> —("In Memoriam," c. 55, v. 4.)

To have congenial work that fully occupies the mind and does not exhaust, to have plenty and leisure for exercise and delight, is our vision of Elysium; we should certainly try to approximate this earth to Elysium when we can, and as nearly as we can; but as the population increases, and there is less and less margin in the means of subsistence, we shall at least have to give the whole day and our whole strength for a day's meal.

Democracy is another splendid vision, for what can be so desirable as that every ratcatcher, lumper,* and knife-grinder should have his full share of wisdom, courage, temperance, and justice, and that his patriotism should be as great as that of the best and the highest in the land; without these virtues Democracy, in its proper sense, can hardly exist, and certainly cannot last. I say Democracy in its proper sense—that is, government by the whole people, and not, as the word is misapplied, to describe that part of the population which works only with its hands. To hope for a good and lasting Democracy is, I fear, the triumph of hope over experience. We see in Plato's Republic a visionary attempt to obviate the monstrous evils of Athenian democracy, so bitterly satirised by Aristophanes in "The Knights," and you must recollect that Plato's Demos, or body of voters, excluded most of those that worked with their hands, for these were mainly slaves.

I think it is Pausanias who says that the Athenian republic was the only democracy that ever improved its condition, and Athenian supremacy only lasted from the battle of Platæa 479, to that of Chæroneia 338 B.C., some 140 years, while the Roman aristocratic republic lasted 361 years, from the burning of Rome by the Gauls, till the founding of a despotism by Augustus, and 357 years from then till the removal of the Metropolis to Byzantium, in all 718 years, and then the Eastern Empire lasted 1,123 years longer, till it was extinguished by Mahomet II. in 1453.

You may possibly ask yourselves what these matters have to do with architecture? They have this to do with it, that before we can try to embody ideals we must know what they are; and then, as architects, we must ask ourselves if such ideals can be expressed by building; if they cannot, we must see if the buildings devoted to that end, can be so carved or painted as to make clear the ideal they were built to illustrate. I think that abstract ideas can only be suggested by the use of symbols and emblems. The need of both is now mostly overlooked, and if not overlooked is ridiculed; yet without them how can abstract ideas be represented? Antiquity and the Middle Ages were pervaded by symbolism, and their works were full of emblems; and I do not see how it could have been otherwise. If it was ever necessary to have symbolism, emblems, and emblematic figures to express abstract ideas in buildings or in figures, how can we dispense with them now, if the same lessons are to be taught? We generally do without these lessons now, because those in power foolishly think the lessons taught by the visual fine arts are of little consequence, or are not wanted. How could Hercules be distinguished from an athlete without his club and lion's skin, Neptune without his trident, Bacchus without his leopard, vine-leaves, and thyrsus, or Juno without her peacock? Could we recognise the figures of the Evangelists without their emblems? In Gothic buildings symbolism was universally adopted, if we may believe Durandus; and even now there are the remnants of former symbolism in our minds, for we all recognise the symbol of the Cross in cathedral plans, and of the spire, as pointing the way to heaven.

We want to express the higher ideals in buildings that are to be used for high ideal purposes, and to express them so that the multitude may recognise them. How can they be expressed without symbolism? Plain buildings show three things outside: firstly, the mechanical devices for making them stand; secondly, the devices for keeping out the weather and for the protection of the structure; and thirdly, by their shape and openings, they suggest something of their internal use. Inside, buildings tell much the same tale, but we may perhaps make a better guess at their uses, by the quantity and position of the light admitted. Every building should have some touch of fine art about it, not only because it is made by man for man, but also because it takes from all, light, air, and prospect.

It seems to me that all architectural buildings can effect without symbolism, is to raise certain emotions, and when architects know how to raise such emotions in their buildings, they must see that these emotions are not unsuited to the destination of the buildings. I hope to show in a future lecture how the art of raising emotions may be learnt.

Probably there are two great master ideals in the present day, the idea of liberty as a means, and the pursuit of truth as an end. I think Aristotle defines liberty as the absence of any outside power, tending to prevent us doing what we believe to be right, and Plato defines a Tyrant as one who endeavours to get rid of the good people in a state, and keep the bad. To say the least, it would be difficult to build anything that could express either of these complex ideas.

Supposing a building to Liberty were wanted, the architect who had to design such a building must know how it was to be used, whether it was to be a temple for the worship of Liberty, a hall for lectures on its advantages, or a mausoleum in honour of those who had secured it for their nation. If the former, then there must be a ritual, and the architect must know what that ritual was, whether there were to be priests and a high-priest, and how these priests would group themselves and what they were to do, and how the worshippers were to express their adoration. He would want to know whether his building was to accommodate a few persons or multitudes, whether it was to be simple, stern, or magnificent, whether it was to be light or gloomy, whether it was to soar to heaven or to grovel on the earth, whether it was to inspire awe, admiration, or love; but I must confess that I do not see how he is to make it show its particular object unless the forms and features had a symbolic significance. A spire is now the sign of a building devoted to divine worship as a dome once was, and as the circular niche now is in Moslem buildings. But even with architectural symbolism it would be hard to express the idea of Liberty by a purely architectural building without figures, or to hold up for imitation its most important phases; to do that the architect must, I think, have recourse to the sculptor and the painter. What could the sculptor and painter do to embody this ideal? Is there to be a statue or picture of Liberty? and if so, is Liberty to be represented as a man or a woman? and what symbolism is to be used to ensure that the worshippers know that it is a statue of Liberty? Or what emblems are to be given to the statue to express its attributes? Sculpture, plain or coloured, would be needed to show the advantages of liberty and the evils of the want of it, to give a history of its good effects at various epochs, and of its intolerable evils when it was degraded into licence. We know that in the Middle Ages at least, there were recognised emblematic figures of the cardinal virtues and of the deadly sins, and that all the arts and sciences were emblematically shown so that beholders could read the meaning. I merely instanced the ideals of liberty and the pursuit of truth to show the difficulty of expressing any abstract thought by building, if it had no recognised symbolism attached to it; even with the assistance of the painter and sculptor. All I insist on is this: that you must have some noble ideal, to be made clear to the public by buildings before you can enlist the sympathies of the most gifted men, and fire them with ambition to design buildings worthy of such ideas; for to be able to design such buildings not only presupposes men of genius, but that they have striven through long laborious years to acquire the necessary skill. You may be sure that the Athenians had an adequate motive to perfect themselves in designing their temples, when they believed their deities, and particularly the Virgin Goddess, had just saved them from the dreaded Persian yoke.

We see, too, how they embodied their ideal; the temple was a glorified house with a single or double verandah all round it; while the architectural detail was treated by a choice of the simplest and most exquisite forms, on which the sun played melodies from dawn till dark; the composition of lines was unapproachably perfect, and the destination of the temple was proclaimed by sculpture; that of the Parthenon portraying the birth and achievements of

* A labourer who does not work by the hour, but moves merchandise at so much for the lump.

the Goddess and of the honours paid to her at Athens; the whole composition of architecture and sculpture together attaining sublimity.

The Saracens had an adequate motive for thanking Allah, who through his servant Mahomed, had welded all the hostile tribes of herdsmen and robbers into a nation; had changed their idolatry into a monotheistic worship; and had given them the world to conquer and to pillage. The Saracens, however, were destitute of arts, sciences, and learning when they left Arabia, and time was wanted for them to acquire knowledge and to create a style.

When that knowledge was acquired, their style almost necessarily took a marked geometrical direction; for the image of no living thing was allowed in their temples, lest they should relapse into idolatory. Their style culminated in geometrical ceilings, cornices, and patterns, of almost superhuman skill and of maddening complexity.

You may be equally sure that the Mediævals had an adequate motive for building their temples in the best and most perfect way, to honour those saints who had enabled them to win the Holy City for the Cross, and to conquer the hated Saracens.

Jerusalem was won in 1099, and held for nearly a century.

The Crusaders, during their stay in the East and their intercourse with the Saracens, imbibed, we suppose, some of their learning, and some of their passion for geometry, and finding they were inferior in civilisation to their enemies, tried at home to rival the Saracen monuments.

However it may be regarded, it is beyond question that Gothic emerged about a century after Jerusalem was taken, and rapidly progressed until it was killed by contact with the Renaissance. We must never forget that the whole period of the Middle Ages in Europe was saturated with Arabic lore. All that was known of the Greek geometry and philosophy, and to a great extent of the Greek authors, was through Latin translations of the Arabic versions made by Jews. Up to 1700, a translation of Averrhoes* "Great Commentary on Aristotle" was used in the Italian universities; although the Italians had reconquered Greek in the fifteenth century. The Renaissance was another great architectural epoch mainly due to a new ideal. The Italians had, through their classical studies, been led to mentally break their ecclesiastical fetters; fetters that had condemned their minds to sterility, and their bodies to asceticism. Their new freedom enabled them to investigate nature, and prompted them to try to equal the masterpieces of antiquity. Unhappily, in architecture, they were too much taken with the size and magnificence of their ancestor's buildings to think of aught but imitation, particularly as they were not constructors, and had produced no style of their own; in spite, however, of this unhappy state of mind, we must never forget that the Italians, and when I speak of Italians I mean Tuscans and Umbrians, had a passion for every possible form of beauty.

I may seem to have dwelt too much on the embodiment of national ideals, but I believe it has exerted a great influence on all the developments of architecture. We cannot even look at the remains of ancient Rome without feeling that there was a striving after an ideal grandeur and dignity. We are so apt to look on architecture as a mere conquering of the difficulties of arrangement, of construction, and of rendering the whole agreeable to the eye, that we are apt to think these points are all that is necessary for true architecture, forgetting that it has a soul; but it is the very absence of this that has made modern architecture so different from that of the past, and so little relished. Balzac, in one of his episodes, speaks of sculpture, and says it is not difficult to make a statue of a man, but to breathe into it the breath of life requires the efforts of a man of genius.

I wish to point out that though enthusiasm will work wonders, by giving mankind almost superhuman strength, it will not work miracles; it would not enable a thirteenth or early fourteenth-century artist to draw figures like Masaccio, Raphael, or Michelangelo; it would not enable a man to be a first-rate performer on a musical instrument who had never tried to play. A man must master the elements of what is known in his profession before he can endow his work with his own personal likings, much less can he, without that knowledge and skill, impart to it the impalpable ideals of his time.

We want to realise the highest aspirations of society in our buildings if architecture is to rise to its due height, or else it will remain but a sort of transcendental mechanic's work. I think architects are learning the way to put all their thoughts and emotions into their work.

The inspired votaries of each of the fine arts would probably tell you that they embody all their thoughts and emotions in their works; musicians certainly tell you so. In Romanesque, and even in Gothic architecture, there is something of the mystery and turmoil of the thoughts of those days, for though there was a certain Renaissance of learning and knowledge, the the passion for over-running new countries, for plunder, fire-raising, and slaughter was still seething in their blood, and was a dominant motive for the Crusades. The first Crusaders had seen strange sights, their hopes and fears had been excited in perilous journeys through unknown lands, in combating hunger, thirst, hardship, and disease, in fighting with the all-conquering Saracens, and all these emotions had culminated in the glory of having again won Jerusalem for Christian worship. You must remember, too, that society was then perpetually being thrilled by its profound belief in the delights and horrors of another world. I have tried to roughly sketch some of the surroundings of the men of that day, and from among the men of that day came the artists. I want you now to comprehend one of the necessary conditions for the artists being able to embody their thoughts and aspirations in their work. Whether these artists were poets, painters, sculptors, musicians, or architects, they must have had the mechanism of their art at their fingers' ends, for without that there was no possibility of embodying in their work the varied knowledge they had, nor the tumultuous emotions that possessed them. Such a mastery over the mechanical part of any fine art can perhaps but rarely occur, but without it the embodiment of ideals cannot take place. This mastery occurred in Athens after the Persian war, among the Saracens after their conquests and the creation of a style, in Christendom after the early Crusades, and in Italy at the Renaissance.

I do not compare the present turmoil of knowledge, invention and discovery, of hopes and fears, of visions and aspirations, with those of the Crusades; for multitudes have not now suffered the hardships and horrors of the early Crusaders, nor has Europe conquered the conquerors; but short of this, the wonders that we have become acquainted with, are much greater than those that ever presented themselves to mankind before. This age of ours ushers a new Renaissance in most branches of knowledge. The application of electricity and steam to machinery has not only multiplied our powers of execution a thousand-fold, but with the discoveries in chemistry has created for us wonders that outstrip the imagination of the poets. Men are pursuing enquiries on a new basis; they are trying to find out the history of the creation of our universe, the growth of worlds, the composition of the ether, what life is, and how it originates, what electricity is, and what force is, and how both come to be transmutable from heat to motion, or from motion to heat; why the wind blows with varying force at certain times, and in certain directions; why rain falls unequally, why eruptions, storms, and earthquakes arise, and how gravity is transmitted. A new science of invisibles has been started, and it is found that organisms, invisible to the naked eye, pervade all life, and that certain of them are as necessary to its continuance as some are fatal, and we have to a great extent, learnt how to avoid pestilence and famine. There are new investigations of what is virtue and what is vice; new theories on the proper organisation of society; investigations of how the earth, man, and animals came to their present state; how man acquired and perfected speech; how he came to his beliefs, and how they progressed.

All this is not without its struggles and conflicts between the thousand shades of knowledge, feeling, and desire; from those who think this the best possible of all possible worlds, to the madmen, who, in the hopes that a better condition of things will spontaneously arise, would tear up and destroy everything.

If you students are to be the architects to deal with this turmoil architecturally—and if you are not, who are to be?—it is necessary that you should have all the mechanical part of architecture at your fingers' ends, and by the mechanical part I mean that part that can be taught, for at present Nature alone produces genius, and to us it appears in a haphazard way; this, however, is merely through our ignorance, for without doubt she follows unvarying laws, as in every other case that has been investigated. Let us hope that some day the perfecting of man will have the same attraction for philosophers as the perfecting of sporting dogs or of racing horses, of sheep that cannot leap, or of pigs that will fatten; and then we may look for the gradual development of a superior race.

The business before us, however, is to deal with what we have, and to see if there is any way by which the breath of life can be breathed into our architecture. I think there is a vigorous vitality in the atoms, whose products are the architecture of the day. We may be thankful, too, that there is perfect architectural liberty, though at present this liberty has produced nothing but chaos; we want to find out the power that will cause all these atoms to coalesce into one organised whole, so that the forces that now cause simple divergence, may produce instead continuous progression. I must not, however, conceal from you, that there are distinguished architects who say that this chaos is not only useful, but should be a cause of pride; for that genius, knowledge, and skill can now be shown in a hundred different ways instead of only in one. That we can have paraphrases of Egyptian, Assyrian, Persian, Greek, Roman, Romanesque, Saracenic, Gothic, and the different phases of Renaissance, besides Chinese, Burmese, Siamese, Japanese, and Indian architecture. I by no means deny the possibility of erecting buildings with certain fine quantities in any of these deceased or living styles. Hundreds of such exist in the world, but I look upon them as being the shame rather than the glory of Christendom. Such buildings can never, in my opinion, be perfectly logical, since in construction alone they must be behind the present knowledge or must pretend to be, for many of the modern long stone architraves are merely tied up to iron beams: nor can such buildings be the exponents of the taste, thoughts, and aspirations of the day. I think if such boasts be not a defence of their authors' own paraphrases, and a tacit regret that they were unable to invest their buildings with the expression of the day; they must take a different, and what is in my opinion, a lower, view of architecture than I take. I desire to see architecture representing the greatest knowledge, skill, and taste that exists, as well as the highest aspirations of the day, so far as these thoughts and aspirations can be expressed by building. I look on the paraphrases of former styles as merely the exercises of artists to acquire the mastery of their art. I think, too, that the best architects of the day are rather ashamed of this chaos of paraphrases, and would be the first to hail any real progress with delight. It is true that anything new must be founded on something, for nothing in this world springs full grown and armed, like Minerva from Jupiter's brain, but as yet a true forward movement is not visible to our eyes, though it may be in the course of formation.

There are as yet no buildings called for, that demand the fullest powers of architects, nor their greatest striving to embody the highest aspirations of the time; most of the new buildings are for more or less commonplace uses, or are buildings for a jumble of uses, and such buildings must necessarily lack that unity of purpose which the finest buildings ought to possess. It has been often said "that religion is the mother of architecture," but the religion of this latter part of the nineteenth century, has certainly not yet excited the passionate enthusiasm of mankind.

Although I admit, with grief, that there is at present very little liking for architecture in England; I am half inclined to believe that this want of appreciation is partly due to this, that no one has yet embodied in his buildings the aspirations of the day, so as to take the public by storm. In spite of Dr. Johnson's opinion, which he put rather coarsely, I hold that the artist, be he poet, painter, sculptor, musician, or architect, is very nearly the tailor of other men's thoughts; he is the genius that can express, depict, portray, or embody the vague desires and aspirations of the people of his day. If you put this the reverse way, I do not see how it can be doubted. The difference of the present aspirations from those of the past, make it impossible for any persons but antiquaries to relish reproductions, in the way that the higher aspirations of the present would be relished; and could some superhuman architectural genius portray the aspirations of some future time, say those of only a hundred years hence, how is it possible that we could fully sympathise with them, when our surroundings are so different? For—

"I doubt not thro' the ages one increasing purpose runs,
And the thoughts of men are widen'd with the process of the suns."

—Tennyson, "Locksley Hall."

* "Averrois che'l gran comento feo."
—(Dante, "Inf.," c. 4, l. 144).

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE LEGAL POSITION OF ARCHITECTS IN RELATION TO CERTIFICATES AND AWARDS.

THE seventh ordinary general meeting of the present session of this Institute took place on Monday last, at 9, Conduit-street, Mr. Aston Webb, vice-President, in the chair.

Mr. W. H. White (Secretary), announced the decease of Mr. Edward Graham Paley (Fellow), of Lancaster.

Mr. J. A. Strahan, M.A., L.L.B., Barrister-at-Law, then read a paper on "The legal position of Architects in relation to Certificates and Awards," of which the following is an abstract:—

In contracts for works, which were especially liable to give rise to many petty differences between the parties to them, the need of a mode of settling or preventing disputes certainly and without litigation was early felt. Two such modes suggested themselves. The first consisted in making it a condition of the contract that before the contractor had any legal claim for payment against the employer, he must carry out the contract to the satisfaction of some given person. The second consisted in making all differences between the contractor and employer referable for consideration and settlement to a third person. The first mode might be called settlement by certificate, the second, settlement by arbitration. In order that a certificate might settle anything, the granting of it must be made by the contract a condition precedent to any right of action on the part of the contractor. And even when a certificate was made a condition predecent, certificates given during the execution of the works—progress certificates—settled nothing but the legal right of the contractor to claim the amount certified in them. They did not constitute an approval of the work done, nor prevent a subsequent revision of the payment made under them. An arbitration might be and frequently was made a condition precedent to any right of action on the part of the contractor; but this was not necessary to render an arbitration an effective settlement. The award of an arbitrator duly appointed was equally conclusive of the matters referred to him whether it was or was not a condition precedent that there should be an arbitration before any action would lie against the employer. In contracts for works the certifier was almost invariably the architect in charge of the works, though this was not legally a necessity: if the contract provided that the employer himself should be the certifier in point of law there would be no objection. Usually the arbitrator—if the contract contained a reference clause—was an architect. Of late it had become common to specify as arbitrator the architect in charge of the works. At first, this practice was regarded as of doubtful legality, as to a certain extent making the architect a judge in his own cause. Recent decisions had dissipated this doubt. The settlement of disputes arising out of building contracts having become one of the commonest duties of an architect, it was important that he should clearly realise his legal position and liabilities in the matter. The position of the architect varied enormously, accordingly as he acted as a certifier or as an arbitrator. The cardinal distinction between arbitration on the one hand and certification or valuation on the other was, that the former was a judicial inquiry, while the latter was simply work done by the architect under his contract with the employer. Accordingly, an architect acting as an arbitrator was a quasi-judge, and as such his legal duty was towards the public generally; while an architect acting as a certifier was merely the skilled servant of the employer, and as such his legal duty was towards his employer. This difference was clearly recognised by the law in the powers which it gave the court, which could remove an arbitrator from his office, but could not remove a certifier from his. It could, under certain circumstances, appoint a new arbitrator; it could not under any circumstances appoint a new certifier. In granting certificates the architect was entitled to proceed in whatever manner he pleased. He was not bound to hear both or either of the parties. In conducting arbitrations, on the other hand, he must proceed in judicial method; he must give both parties to the arbitration fair notice of the date and place of meeting, and must hear the parties or their counsel in a reasonable manner and to a reasonable extent. In granting certificates the architect was not bound to be impartial in the sense of not having any settled view upon the matter in question before it actually came before him for decision, or in the sense of being free from all influences, such as personal interest in the decision, which were likely to pervert one's judgment. The court would examine into nothing save the *bona fides* of the architect in certifying or refusing his certificate. In conducting an arbitration, an architect must be impartial, not only in the sense of not being consciously unfair, but he must be impartial also in the sense of not having any settled view upon the matter in dispute before it came to be decided by him, and in the additional sense of being free from all influences likely to pervert his judgment. This rule, however, was considerably modified in cases where the decision of all disputes by the award of an arbitrator not to be subsequently appointed but there and then specified, was one of the conditions of the contract between the employer and the contractor. In such a case the specified arbitrator, while bound not to entertain any concluded view on the matter in dispute until he had heard both sides, was not rendered unfit to be an arbitrator by the fact that he was not free from certain influences likely to pervert his judgment. This modification applied chiefly, but not exclusively, to cases where the person appointed by the contract to be referee in all disputes arising out of the contract was the architect or engineer of the employer. Such references were, as had already been said, formerly regarded with dislike by the court as making the architect judge in his own cause; but of late the leaning of the Court had been in the opposite direction. It held now that such a reference was good and must be enforced against the contractor, provided the latter knew at the time he agreed to it that the architect in question was the architect to the employer, that nothing which might not reasonably have been anticipated by the parties had happened since the appointment likely to pervert the arbitrator's judgment, and that there was no evidence that before the parties had been heard the arbitrator had formed a fixed and unshakable opinion on the merits of the dispute. This was exemplified by the circumstances of the case of "Jackson *v.* Barry Railway Co." It must, however, be remembered that the principle exemplified in this case applied only to matters which were known, or which might reasonably have been anticipated, by the parties at the time the building contract was entered into. On no point was the difference in the status of the architect, according as he was granting certificates or conducting a reference, more marked or important than in the matter of personal liability. In granting certificates he acted as the skilled servant of the employer, and accordingly was liable to the employer for any damage to the latter which might arise from his negligence or want of skill in granting them. It was true no amount of negligence and no want of skill would render the certificate, once granted, the less binding on the employer. In the words of Mr. Justice Willes in "Goodyear *v.* Mayor of Weymouth," 35 L.J.C.P. 12 [1865], "If you employ an architect who does not know his business, and who certifies that he is satisfied when he ought not to express satisfaction, you must be bound by his mistake." To the contractor, on the other hand, the architect, in granting certificates or in refusing them, owed no duty whatever save that general one of common honesty. No want of skill and no amount of negligence on his part, however disastrous this might prove to the contractor, would render the architect liable in damages to the contractor. In granting certificates, then, the architect was liable for want of skill, negligence, or fraud in respect to the employer, and for fraud only in respect to the contractor. In conducting arbitrations, on the other hand, the architect, whether acting as sole arbitrator by agreement between the parties or under the direction of the Court, or whether acting as a joint arbitrator, the representative of one of the parties to the arbitration, was a quasi-judge, and as such he was not the servant of anyone, and was not liable to anyone for negligence or want of skill, however gross. His award was not as binding on the parties as a certificate. It might be set aside for other things than fraud—for mistakes in law or fact appearing on its face, for instance, for want of finality, for misconduct in conducting the arbitration, or because further evidence had arisen since the close of the proceedings. But in conducting the proceedings and in making the award, the architect acted in a judicial capacity, and accordingly, like other judges, he was personally liable, not for negligence or want of skill, but for fraud and for fraud alone. From the point of the view of the architect, settlement by certificate had the enormous advantage that it left him master of the situation. He was entitled to decide every dispute finally and conclusively by his mere *ipse dixit*. On the other hand, it had the disadvantage that if he negligently certified for what he should not certify, he might find himself mulcted by his employer in an action for heavy damages. Settlement by award, from the architect's point of view, varied very greatly according as the arbitrator to decide disputes was the architect himself or a third person specified. In the former case he remained nearly as much master of the situation as in the case of settlement by certificate; in the latter case the only advantage accruing to the architect in charge of the works was that he was relieved of the somewhat invidious duty of deciding on what was virtually his own dispute. From the contractor's point of view, settlement by certificate had, beyond its certainty and cheapness, little but disadvantage. It placed him absolutely at the mercy of the architect; though it was to the credit of the profession that contractors were so ready to confide the decision of disputes to the honour and honesty of the architect supervising the works. The advantages of settlement by award, from the contractor's point of view, depended on who the arbitrator was. If the architect in charge of the works, the contractor's position was practically the same as under settlement by certificate, except that before the dispute was decided he was entitled to be heard by the architect—a privilege which usually cost him as much as it was worth. If, however, the arbitrator was a third person, and more especially if he were not an experienced person, the contractor's position was a very pleasant one. He could harass the employer by making all sorts of allegations as to the conduct of the architect and the employer himself, and insisting on having all these investigated. Very often the mere threat of them was sufficient to induce the employer to come to an arrangement to the advantage of the contractor, and, if the matters in dispute did come before the arbitrator, the contractor was pretty certain to get something. From the point of view of the employer, settlement by certificate was obviously the most advantageous mode of settlement. Settlement by award when the arbitrator was the employer's architect was, from the employer's point of view, much the same as settlement by certificate, except that it was more expensive, scarcely so conclusive, and the architect was not personally liable for mistakes. Settlement by the award of a third person, however, was as disadvantageous to the employer as it was advantageous to the contractor. It was harassing, extremely expensive, and very liable to be unjust to him in its result. Indeed, almost its only advantage over an action at law was that as a rule the award finally concluded the dispute.

The Chairman in inviting discussion, said they had had a most able and interesting paper from Mr. Strahan, on a subject of the greatest importance to architects, and which he thought came rather conveniently at a time when the Institute would probably before long be considering the revision of certain of the conditions of contract under which they at present worked.

Professor Kerr had great pleasure in proposing a vote of thanks to Mr. Strahan for his able paper. The result of Mr. Strahan's reading of the paper must be to create a good deal of alarm. It was true that they were accused—and rightly accused—of frequently not understanding the law they had to deal with. But some of them might not have supposed it possible that they could misunderstand the law so much as the learned lecturer would seem to imply. However, the point he had made from the position of the architect seemed to be this: that with the courts, as at present constituted—one could not answer for what might occur before very long, as they were always changing their minds on matters they did not understand—that the courts, as at present constituted, drew a marked distinction between the arbitrator and the valuer. That would be new to a good many architects. When the valuer, who in practice was generally the surveyor, delivered his decision after being properly appointed, that decision was better not to be disturbed unless fraud could be suggested in some way or other. It was a different thing with the architect, who was giving a decision upon points which were not points of valuation, as between the employer and the employed. He would use the words which the lecturer had made use of, and say that, to the honour of the profession to which they belonged, it must be admitted that the decisions of architects were, as an almost universal rule, loyally given and loyally accepted. He had said before now that, but for the loyalty of the architect, it was scarcely easy to understand how many building contracts would be able to pull through at all. He believed that every architect who was a member of the Institute, and who had heard the discussions which took place

on such matters, did accept for himself the situation of an absolutely impartial judge between his own employer and the contractor. That was a very unusual condition of things, but a condition which existed to their very great honour. Not to dwell at any length upon the question, which the lecturer had so ably discussed, namely, the difference between the valuer and the arbitrator, let them not forget the favourable mode of deciding building disputes, which was adopted under the Building Act with regard to party-walls. The plan was this: there were no valuers or arbitrators, but each party to the dispute appointed his own agent, called his own surveyor. The two surveyors appointed a third, and any two of the three delivered the award. Now, from his experience in such matters, which had been considerable officially, he would say that no other mode of settling building disputes was comparable in the slightest degree to this, for facility and satisfactory administration. The great characteristic of that mode of settlement in building matters was this, that they got rid of the non-courageous mode of delivering a secret award. A man who gave his decision and retained his reasons was not a courageous man, and no judge on the bench ever did so. No judge belonging to the legal profession ever gave his decision but subject to an appeal, except in the case of the House of Lords. But when an architect or surveyor delivered his award, giving no explanation, and declining as a matter of rule to do so, it was a different thing. They got rid of that by the Building Act, and the *modus operandi* was this: When the original surveyors held diametrically opposite views, each doing the best for his clients, though not holding views which were excessively extravagant, when they met with a third man the whole matter was discussed. The third man gave his opinion, from time to time, as the others stated theirs, and the consequence was that there was an opening for compromise. In litigation there was no chance for this; one man was declared to be altogether right and the other to be altogether wrong, although the difference between them, as regards justice, was not equal to a finger's breadth. The tribunal of the three surveyors discussed the matter quietly, and the third surveyor, if he happened to take a peculiar view of the matter, was always open to argument. The consequence was, that when they had argued the matter out, and could not settle it, the third had to say: "I think we have discussed sufficiently, and my opinion is not shaken; I think we had better settle it." Then both parties were informed of what had taken place, and the result was that generally both sides were satisfied, whereas, by the system prevailing under the legal form, the probability was that both parties would be dissatisfied. With regard to the two capacities in which the lecturer had said the architect would find himself acting, Mr. Strahan must excuse him for saying thas it was almost impossible for a layman to discuss it on the same ground as he did. They considered it unfair for the architect to be the absolute judge, without appeal, between his own employer and the builder. The lawyers might consider that fair, but architects did not, and, therefore, they had an arbitration clause, which, he understood, worked well, and which, he believed, would work a little better if the arbitrator were like the third surveyor. It was very good of Mr. Strahan to come and discuss such a subject, which he evidently understood exceedingly well.

Mr. Edwin T. Hall, in seconding the vote of thanks, said the attitude which the Institute had always taken up had been that the architect should take upon himself a judicial position. It must not be forgotten that, for one case of dispute they heard of, there were probably 999 contracts which had been concluded without any dispute whatever. That spoke strongly for what the lecturer had been good enough to refer to, viz., the honour of architects, and the readiness with which their decisions were accepted. Mr. Strahan had spoken of the architect as a certifier and as a referee, of settlement by certificate, and by award, and he had dwelt in a clear manner on the essential differences between the two positions. Professor Kerr had drawn attention to the fact that there was generally a third person, the valuer, and that rendered their duties simpler when they were acting as judges, whether by certificate or by award. The position of a judge of first instance was an important one, and the view generally held by the Institute was that the architect must of necessity occupy that position even though he was not the final referee. There should be someone to give a decision, which could be appealed against, if necessary, and he should not be afraid to express his opinion just as a judge did in the courts, while they could go afterwards, if they so desired, to the referee to get the decision overturned. Professor Kerr had recommended as the best of all courts that which was prescribed by the Metropolitan Building Acts in party-wall disputes, but he would point out that, as a rule, the questions settled there were simpler, in the sense that there were not many points raised, whereas in an arbitration on a large contract there might be hundreds of points in dispute, and it would be almost impossible for any award to be made by two out of the three, where there was an arbitrator, with an architect on the one side and a builder on the other. If it were constituted as a court of three, consisting of an independent person, with a representative of the employer on the one side, and the builder on the other, it would be almost impossible for two of them to agree on an award, because on fifty points the arbitrator might agree with the employer, but on the other fifty he might agree with the builder. Their practice brought about the result in a somewhat different way. The architect on the one side, and the builder on the other, stated the case; the threads were gathered up by an independent arbitrator; and though he might agree with fifty points on the one side, and fifty on the other, his award settled all the matters in dispute. Thus, while there were three persons engaged in the matter, the decision rested with one of them. The question of the final certificate was a very important one. He believed the thing to do was not to give a final certificate except as a last one for money payment. If a certificate of completion were given and something was discovered which was very improper, the architect had probably taken upon himself the responsibility of relieving the builder from his liability, and he would be liable for an action by the employer for *laches*. That was the opinion given by very eminent council to the Royal Institute of British Architects, who advised that the architect was liable for *laches* to his employer. Therefore, the view they hoped shortly to submit to the Institute was that there should be no final certificate of completion, but that the builder should be left to the Statute of Limitations, and then there would be no liability on the part of the architect to the employer, while the builder would rightly take upon himself that responsibility which belonged to him. The Builders' Institute had agreed to that, and, therefore, in their new conditions the point would be laid before the members. No doubt everyone present approved of the arbitrator being an independent person, but that was not the practice of any of the big Corporations, their rule being that the architect of the building should be the final referee. That was the course, he believed, pursued by the Corporation of the City of London, by the Government, by the Asylums Board, and other large bodies, and he understood that, as a rule, it worked very well. Still, for ordinary contracts, it was not a view which this Institute had taken, and which they, as individual architects, had held. It must be fairer that an independent person should settle matters in dispute, because they were almost always in dispute between the architect and the builder.

Mr. William Woodward was surprised to hear the last part of Mr. Hall's remarks. He should have thought that at some period of an architect's history in connection with a building, he would have the courage and the honesty to have cleared the contractor from his responsibility. Mr. Woodward then referred to clauses 11 and 17 of the conditions of contract issued by the Institute, and contended that it must be unfair to the contractor to endeavour to insert in the new conditions the recision of the final certificate. The architect sometimes allowed too long a time between the granting of the final certificate and the completion of the work. If a wise man, he allowed at least twelve months, and even then he was not compelled to grant the final certificate, if he had any doubts as to defects of workmanship or material. With regard to the tribunal, there was a great deal in what Professor Kerr had said, and Mr. Hall had pointed out some of the little difficulties which would arise in the multitudinous matters which occurred in carrying out a building contract. To allow an architect to be the judge in his own case appeared to him to be a condition which it should be the endeavour of everybody to upset rather than to support. The builder should have every facility afforded him to open up causes of dispute, and should be protected from any oppression on the part of the architect. His advice to every contractor would be, knowing the weakness of human nature, not to allow the architect of the job to be the sole arbitrator. The conditions issued by the Institute were quite sufficient for the protection of the architect, if carried out by a fair-minded man, and there would be no necessity for the clause which Mr. Hall had shadowed forth, and which he would do his humble best to set aside.

Professor Banister Fletcher remarked that he remembered two cases of the issue of final certificate, in connection with the London School Board, where the Board had, nevertheless, the right during four years to investigate the buildings. This was done at enormous loss, the schools being taken almost to pieces, and the result was that one builder gained the day, while the other builder lost it. He thought that illustration would show Mr. Hall that some one must take the responsibility off the shoulders of the builder at a reasonable time. On these grounds, Mr. Hall would doubtless see the wisdom of the architect taking his proper position. He did not believe that any profession had suffered so much as theirs for the want of understanding it in the case of the legal profession. The lecturer had spoken of the architects as being third parties to a dispute, and as being judges of their own causes. It was not so; the architect being simply appointed to see the particular contract carried out. With an honest and straightforward architect there should be no difficulty, and a good builder was also desirous that his reputation should not be lowered by the erection of a bad building. He thought it would be well if the Institute would endeavour to show lawyers what the exact position was, and endeavour to do away with the responsibility now put on the architect by the employer and by the lawyers.

Mr. William White, F.S.A., thought they should take into consideration the character of the builder, and provision must be made as against a good or a bad one. From a very considerable experience he was happy to say that he had had very few disputes, and in cases where disputes had occurred it had not been in connexion with the highest class of builders. In his contracts he inserted a clause that if any extras should arise the builder should give the particulars, and that by negotiation they should be settled as the work progressed. He had found this simplified matters wonderfully, although it had in some instances occasioned a considerable amount of additional labour.

Mr. T. M. Rickman said that in the earlier part of the paper he found certain matters stated, upon which he differed, as matters of fact, with the lecturer. One was as to the increasing habit of appointing the architect as the arbitrator on the work. He doubted whether that was the case. Then, again, there were one or two things on which it would be well for the younger members to think twice before they acted upon them. It seemed to him rather dangerous to point out that under certain circumstances no want of skill, or amount of negligence on their part, however disastrous to the contractor, would render the architect liable to him. It was more desirable indeed that the younger men should be advised to exercise all the care and skill possible. When he had read the paper through, however, he was perfectly satisfied that Mr. Strahan had drawn a fair conclusion from the various advantages and disadvantages in connexion with the two courses discussed by him. He had great pleasure in agreeing with what had fallen from Mr. Hall, on the subject of the final certificate. He believed, as a matter of fact, that the final certificate was seldom given. He had always considered that during the course of the contract the architect should have certain powers as regards materials, the mode of working, the order in which the work was to be done, and authority on other matters during its progress. All these matters too must be the subject of arbitration if disputes should arise. Then there was the question as to whether an arbitrator should be brought in during the early stages of the works. The certificate to be granted, the amount received, the value of the works executed, unfinished materials, and all the rest of it, when the building was one-half to two-thirds completed, were exceedingly difficult questions. In one instance with which he was acquainted, had the builder taken advantage of the award, and made use of the knowledge he could have gained therefrom in the middle of the work, he would have been saved from some of the consequences of bankruptcy, and the works would have been sooner completed. That was an instance in which it was necessary that there should be the opportunity of having an arbitration in the course of the works. As the lecturer had said, it was

of the greatest importance to clear the contract up, and to get the work done, and for that purpose the architect should have strong powers reposed in him.

Mr. C. H. Brodie considered that the architect was in a sense the servant of the employer, but directly the contract was signed that condition ceased, because he then had simply to see that certain things which were definitely formulated were carried out, and he could not, if he were a just man, be any longer the servant of the employer. Why their legal friends should be so fond of bringing out this phrase of the architect being the servant of the employer, he could not understand, because it was not quite just. As to the question of awards, there was another case in which members of the Institute were frequently called in to give an award, and that was in the case of competitions. In such cases, he would strongly commend Professor Kerr's words, that they should not be afraid in giving a decision, to state their reason for it.

The Chairman said they had had a very interesting discussion upon the paper. He had always considered that in all conditions of contract the architect was always made absolute, during the progress of the work, in regard to the question of materials, and the manner in which the work was executed. If that were not so he did not see how the work could ever be finished.

The vote of thanks was then put, and was very cordially received.

Mr. J. A. Strahan said there was not much left for him to reply to, because the criticisms made by each speaker seemed to have been answered by the next. For instance, Professor Kerr had instanced the practice under the Building Act as a perfect mode of deciding building disputes, but Mr. Hall had pointed out that it was not a very judicious method, and he agreed with what Mr. Hall said on that point. Again, Mr. Hall had objected strongly to certificates of completion, and had said that they should not be granted by the architect. As a matter of fact, he (the speaker) had not discussed the expediency of final certificates, but if he were to reply to Mr. Hall he should adopt what Mr. Woodward had said, viz., that there should be an end to the builder's liability within a reasonable time. At the same time, a certificate of completion did not mean that there should not be a period of maintenance. He considered that the architect took very little personal responsibility in connexion with such a certificate, he being liable only for negligence. In the case of a settlement, for example, he did not think any court would hold an architect liable if it took place four years after the date of the certificate. The Court was very reluctant indeed to hold an architect responsible for anything less than gross carelessness or gross incapacity, and if he granted a certificate carelessly it was only reasonable that he should be held responsible. He would like to point out that he had not come there for the purpose of stating what the law should be, but of stating what the law was. Lawyers were not makers of the law. Judges might, to a certain extent, make the law, but the barrister's function was simply to explain it. It had been said that an architect, when he had decided a point in dispute in a contract, was not a judge in his own cause. He might not be so morally, but lawyers were practical people, and when they found that an architect's reputation might depend on the decision of certain points which he himself was to decide, they were inclined to think he was a judge in his own cause. He would say, in reply to Mr. Brodie, that when the law applicable to architects was made, he was afraid the profession of an architect was not particularly in the minds of judges and legislators. It had been decided on the broad general principles of contract that if a contract was made with any man, he was bound to do his duty, and to discharge it skilfully and carefully. The law, therefore, regarding the architect as the paid servant of his employer, held him to be responsible for want of skill or care. The law drew a broad distinction between the architect acting as a certifier, and when he acted as an arbitrator. It was necessary to make the architect master of the situation until the works were completed; otherwise the works might be stopped for many months, and the whole contract be thrown into the utmost confusion.

Mr. Woodward asked if the Institute had been pledged in the slightest degree to the Conditions that they had been formulating.

Mr. Hall said that they had not. The builders had agreed that the clause should be recommended to the Institute for adoption.

The meeting then stood adjourned to Monday, the 11th prox., when papers will be read on "The Value of Simplicity in Architecture" by Mr. Halsey Ricardo, Mr. Basil Champneys, and Mr. Alma Tadema.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—On the 25th ult., Mr. Horace R. Applebee, of London, read a paper upon "The Preparation of Drawings for the various Prizes offered each year by the Royal Institute of British Architects," illustrating his remarks with drawings kindly lent for the occasion by Messrs. W. H. Bidlake, Arthur Bolton, Geo. Kenyon, Frank Verity, and others. Mr. Applebee strongly urged all students under the prescribed age to enter for the competitions, as even, if unsuccessful, the time occupied was never thrown away. After the meeting, Mr. A. J. Dunn was entertained at supper by his fellow-students of the Association and School of Art to celebrate his success in gaining the Pugin Studentship.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—At a recent meeting of the Cardiff, South Wales, and Monmouthshire Architects' Society (the President, Mr. Bruce Vaughan, in the chair) the following memorial was ordered to be sent to the Cardiff Museum Committee:—"That the Cardiff, South Wales, and Monmouthshire Architects' Society memorialise the Cardiff Museum Committee to the following effect: That, unless they have already pledged themselves to any architect, they should invite a public competition for designs for the new museum buildings proposed to be erected in Park-place, the competition to be under the rules of the Royal Institute of British Architects."

CARLISLE ARCHITECTURAL, ENGINEERING AND SURVEYING SOCIETY.—A lecture was delivered before the members of this Society on the 23rd ult. in the Town Hall by Mr. S. W. B. Jack on "Some of Our Cathedrals." Commencing by stating that no country, in proportion to its size, was really so rich in examples of ecclesiastical architecture as England, the lecturer described the main features and history of the following cathedrals:—Exeter, Wells, Salisbury, Winchester, Canterbury, St. Paul's (an elevation also being shown of the former cathedral on the same site), Ely, Peterborough, Lichfield, Lincoln, Worcester, York, Durham, and Carlisle, groundplans of Salisbury, Canterbury, St. Paul's, York, Lincoln, and Carlisle being also shown. Westminster Abbey and Beverley Minster were also described. The merits of the above cathedrals and noteworthy points as to style, special features, &c., were discussed by the lecturer, who illustrated his paper by a large series of limelight views, the lantern being manipulated by Mr. J. J. Gillies. A vote of thanks to Mr. Jack concluded the proceedings.

PLYMOUTH SCHOOL OF ART.—Mr. B. Priestley Shires, A.R.I.B.A., in the two opening lectures of the second session, concluded on the 24th ult., at the Plymouth School of Art, Princess-square, the history of Greek and Roman art, and then dealt with subsequent styles. As regarded Roman architecture, Mr. Shires said the early Romans possessed no style of their own, but borrowed their ideas of building, first from the Etruscans, and at a later period, the Greeks. But there was this to be remembered, that what she did borrow or take she reconstructed in accordance with her own spirit, converting the whole into realisations of grandeur and ostentation in response to the wants which arose from her conquests and wealth. Mr. Shires then proceeded to trace the rise and progress of Roman architecture, naming the principal works erected under the various Emperors down to Constantine, when the seat of the Empire was removed from the banks of the Tiber to the shores of the Bosphorus at Byzantium, A.D. 330. The lecturer laid particular importance to a clear understanding of the position architecture held at this period. Here ancient Roman art practically ended, and a new style at Byzantium was developed and practised through subsequent centuries up to the building of St. Sophia at Byzantium, the Constantinople of to-day, built in the latter half of the sixth century by Justinian. The next style developed, the lecturer said, was that of Romanesque, with its many offshoots in many lands, and that in our own country we know by the name of Norman architecture.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the Westminster Palace Hotel, on the 26th ult., was held the tenth anniversary dinner of the Institution of Junior Engineers. Mr. Alexander Siemens, the President, occupied the chair. After the customary loyal and patriotic toasts had been duly honoured, the toast of "British Commerce" was next given by Mr. Wm. Powrie, who declared that engineers were probably more interested in the development and extension of commerce than any other body of men, and especially junior engineers, who would take a very important place in the progress of commerce. In the absence of Sir A. K. Rollit, M.P., the toast was responded to by Mr. Spooner (Technical Instructor at the Polytechnic Institute). Mr. R. W. Newman submitted the "Engineering Professors," remarking that the future training of engineers should be based upon a sound scientific ground, and not upon the elementary education received at the average elementary schools. Professor Ayrton (Vice-President) replied. Professor Forbes, in giving the toast of the evening, "Success to the Institution of Junior Engineers," said that that body fulfilled a very valuable function. There were few things in the training of an engineer that did him more good and helped him along in his work more than seeing what progress was being made in the profession. Incidentally the Professor mentioned that each time he went to America it seemed to him that all his ideas, rules, and principles of engineering had been revolutionised, for in the United States the methods of working were wholly different, and when there, he felt that in England he had been getting into a groove and needed to be taken out of it. At the present time the society numbered no fewer than 400 members, and he congratulated them on the immense progress they had achieved in many directions since they came into existence. Mr. H. J. Young responded. The remaining toasts included the "Absent Members," proposed by Mr. A. H. Dykes, and responded to by Mr. C. J. Roberts, and the health of the President, submitted by Mr. Beaumont, and acknowledged by the President.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of the Institution of Civil Engineers, held on the 29th ult., Mr. J. Wolfe Barry, C.B., Vice-President, in the chair, the paper read was on "Boiler Explosions," by Mr. William H. Fowler, Wh. Sc., Assoc. M.Inst.C.E. The author referred briefly to the theories, such as "deferred ebullition," "dissociation of water," "spheroidal condition," which were propounded to account for such explosions. He showed that it was the hot water, rather than the steam, in the boiler which formed the source of destructive energy, and with a view to illustrate the amount of stored energy available in the event of explosions, pointed out that it was equivalent, in the case of a Lancashire boiler 8 ft. in diameter by 30 ft. in length, at a pressure of 150 lbs., to the work expended in lifting the structure to a height of nearly 8,500 ft., roughly speaking equal to the explosion of 1,700 lbs. of gunpowder. In regard to the causes of boiler-explosions, there was nothing occult or mysterious. They could, as a rule, be traced by patient investigation to the operation of simple and well-known facts. Thus when a boiler-shell was normally in a state of high tension, if once a rupture took place by the action of static stresses on a locally weak spot, the stored-up energy was capable, not only of tearing the boiler to pieces, but of producing all the other destructive effects observed in connexion with such disasters.

LIVERPOOL ENGINEERING SOCIETY.—At a meeting of the Liverpool Engineering Society on the 23rd ult., a paper was read on 'The Theory and Action of some Automatically Balanced Machinery" by Mr. W. Worby Beaumont, M.Inst.C.E., of London, by whom a new principle in applied mechanics is brought into use as a means of preventing the vibration commonly set up by many classes of reciprocating machinery, and of converting into useful work the power usually wasted in setting up harmful vibration in buildings.

CHURCH SCHOOLS, TEACHER'S RESIDENCE, &C., BURTON-ON-TRENT.—Mr. Hamar Bass, M.P., has given a site for and erected at his own cost a new school with residence, and restored the vicarage house at Christ Church, Needwood Forest, from the plans and under the directions of Mr. R. E. Carpenter, architect, of Burton. The builders of the whole of the works were Mr. Sharp, of Barton, and Mr. Mason and Mr. Turner, of Burton. The style of the school building is Classic, built in sma red brick with stone dressings.

Tynemouth Priory: The Choir.

Illustrations.

TYNEMOUTH PRIORY.*

THE ruins which crown the lofty crumbling cliff at the mouth of the River Tyne are all that remain of the once famous Priory Church of St. Mary and the Saintly King and Martyr Oswin.

Nearly 1,270 years have passed since its first foundation.

It is thought by many that the Romans fortified this bold promontory, and for some time held it as a military station. The supposition is strengthened by the fact that an inscribed tablet and votive altar were found when excavating near the ruins a few years ago; they are now in the possession of the Society of Antiquaries, London.†

In A.D. 625 King Edwin of Northumbria erected a wooden chapel here, in which his daughter took the veil. This simple structure gave place to one built of stone by his successor, St. Oswald, and a colony of monks was established adjacent to it. But this soon fell a prey to the devastations of the Danish pirates. In the years 788, 794, and 800 the priory was successively plundered by them.

On the invasion in 865 the monastery was burned, and also the nuns of St. Hilda, who had fled thither from Hartlepool for refuge. In 870 the monastery had been partially rebuilt, and six years afterwards it was again ruined by Halfden, the Danish king, and levelled to the ground. The rebuilding of the church and its repeated destruction went on until 1008, when it was again destroyed by the Danes, and the community were driven from their monastery. The church was to some extent sheltered by the Saxon Earls of Northumbria, who had built a castle on the promontory.

"So great was the sanctity which the monastery enjoyed, that the illustrious dead were brought from various parts for interment";‡ St. Oswin the Martyr, its patron saint, King Edred, Henry the Hermit of Coquet Island; and afterwards Malcolm, King of Scotland, his son Prince Edmund, and others.

A remarkable dream of Edmund the Sexton caused the complete rebuilding of the priory by Tostig, Earl of Northumberland, and the remains of St. Oswin, by Lady Judith, wife of Tostig, and the Bishop of Durham, were brought to light, and transferred to a place of honour in the church. Earl Waltheof, Tostig's successor in 1075, bestowed the church and all its possessions upon the monks of Jarrow; and, again, in 1090, a later earl, Robert de Mowbray, a noble Norman (who conspired to dethrone William Rufus), out of enmity to the Bishop of Durham, gave it to the Abbey of St. Albans, who retained possession of it until the dissolution in 1539.

A colony of Benedictine monks were despatched from the parent house to restore the ruined church of St. Oswin at Tynemouth, and it is recorded that in 1110 the relics of the patron saint were translated from Jarrow, where they had been sent by Waltheof, with great honour and solemnity.

Not long after Mowbray's donation the castle of Tynemouth underwent a two months' siege by the king's forces. On the place being taken by storm Mowbray fled to Bamburgh Castle, and eventually returned to the sanctuary at Tynemouth, where he was taken prisoner, remaining in captivity until the coronation of Henry I. After thirty years of imprisonment he had become aged and blind, and, tired of wars, entered his favourite monastery of St. Alban to pass the remainder of his days. Finally the earl-monk and refounder of Tynemouth Priory died in 1106, and was interred in St. Albans Abbey.

In the reign of Henry II. the liberties of the monastery were largely extended by many Royal grants.

In 1306 the priory was again ravaged by the Northumbrians. Edward II., along with his Queen, and Edward III., visited the priory and offered a cloth of gold at the shrine.

The changeful fortunes in the history of the priory, its priors and monks, the Scottish incursions, and its sufferings in the Wars of the Roses, would detain us much beyond our limit.

The condition of the priory appears to have been prosperous in the early years of Henry VIII., but in 1539 came the suppression of monasteries, and on January 12, 1539, the brethren assembled in their Chapter House to execute the deed of surrender of their possessions.

A life pension of 80*l.* was granted to the prior, Robert Blakeney, and his eighteen brethren were allowed smaller stipends. The monastic buildings were dismantled; the church and prior's house being allowed to remain intact, the former as a parochial church, and the latter as a private residence.

The six bells were removed, it is said to London. The church plate weighed 62 ozs. in gold, and 1,827 ozs. in silver. The manuscripts that were in the library seem to have been gradually dispersed; a "Latin Psalter known as the Book of St. Oswin is now in the British Museum."*

After the dissolution the site was demised to Sir Thomas Hilton, at a yearly rent of 163*l.* 17*s.* The church was used for parochial purposes until the year 1659, when it became too dilapidated, and service was finally discontinued in 1668.

The possessions of this richly-endowed priory were granted by Edward VI. in 1550, to John Dudley, Earl of Warwick, but on his attainder they reverted to the Crown, and in 1567 were enumerated amongst the possessions of Queen Elizabeth.

King Charles I. paid a visit to the castle on June 5th, 1633, and was the last monarch to visit Tynemouth.

Though sufficient of the two churches remain to show their former extent, the remains have suffered greatly since the dissolution from the ravages of time and military occupation. The Lady Chapel, or Percy Chantry, at the east end of the choir, was, in the early part of the present century, occupied as a military store, and had its windows blocked up, but in the year 1850 it was given back to the parish and restored by Mr. John Dobson, who also designed the present stone altar.

On passing through the ancient gateway of the castle we enter the castle yard and stand within the precincts of the abbey.

The west front, which has been greatly mutilated, is divided into three compartments by buttresses running up to its full height; the south compartment, the most complete, is divided into three stages by moulded string-courses; the first being a blind arcade of three arches, the second having two single trefoil-headed and simply-moulded windows, above which is another arcade of four compartments, the arches following the slope of the roof. The central bay contains the deeply-

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of "Tynemouth." Particulars of this and of the three Cathedral series ("England and Wales," "Scotland," and "Ireland") will be found on p. xx.; also (on page i.) of the recent re-issue, in book form, of the series of English and Welsh Cathedrals.

† Sydney Gibson.

‡ Rose's "Westmoreland," &c.

* Gibson.

Tynemouth Priory.

recessed west doorway, of five orders, resting on carved capitals. The inner arch mouldings have gone, but part of the jambs are left. Over the doorway are remains of the sill and jambs of a large fifteenth-century window, extending the full width of the nave, the shafts, caps, and bases of the Early window, or arcade, being visible in the southern jamb. The arcading to the northern bay has been destroyed for the insertion of a late fifteenth-century window, a portion of the jambs and arch of which are all that remain.

The nave has north and south aisles; but the greater portion of them has been destroyed; sufficient, however, remains of the foundations to show the extent and character of the original design. The first two bays from the west are of late twelfth century work; the remaining parts, as well as the piers of the central tower, part of the south transept, and a great portion of the south wall of the nave, are Norman, having been erected about 1106.* A cylindrical column and fragments of semi-circular arches are still *in situ*, at the north-east angle of the nave; foundations of other two Norman piers of the south arcade are visible. The two western bays of the aisles have been vaulted over; the clustered shafts supported by simple carved corbels still remain, with the springing stones of the chamfered groin-ribs.

A solid stone screen of Late Transitional work divides the nave or parish church of St. Mary from the presbytery or church of St. Oswin, and is built in between the western piers of the tower. It is pierced by two low and narrow doorways, giving access to the choir. Its western face is quite plain, with only the remains of a piscina near the jamb of the southern doorway. On its eastern face is an arcade of five small arches, resting on square caps; the shafts are all gone. Two of the tower piers remain to their full height; the one at the south-east angle being shown in the large view, while a portion of the base of that at the north-east corner and a few feet of the one at the south-west angle are all that remain of the other two piers.

The Norman church was originally terminated at its east end by an apse, of which a small portion of the foundations may be seen on the north side of the presbytery. On the south side of nave is a semicircular doorway of two orders. Also the lower steps of what appears to have been a turret staircase of Late work, and a small fragment of Early wall arcading near west end.

All the windows in the nave are walled up.

Turning to the finely-proportioned choir of Late Transitional work, erected about 1200, we find the east end and part of its south wall only remaining. The tall lancet windows are simple in their detail and well proportioned. There is a bold simplicity about its exterior which harmonises well with its bleak situation, being exposed to the fury of the gales from the North Sea. The pilaster-like buttresses are placed at the angles and between the windows, and run up to the full height of the walls, housing the corbel tabling on the south side, and terminating in narrow buttresses in the arcading of the east gable. The angles have been surmounted with turrets. The lower part of the walls of the interior, up to the sills of the long lancet windows, have a continuous arcade running round, and on the capitals may still be seen traces of the "stiff leaf" carving. From the string-course above the wall arcade rise clustered vaulting shafts, with remains of groin ribs resting on their carved and moulded capitals. The "dog-tooth" ornament is introduced in the heads of the windows at the east end, and in the string-course and vesica above; it also appears in the clearstory windows and vaulting ribs.

In the eastern bay of the wall arcade on each side of the choir is a segmental arched recess, the one on the north side containing a slab, on which is sculptured a recumbent effigy of a female with clasped hands, but greatly defaced.

In the centre of the east wall is a deeply-recessed doorway, giving access to the Lady Chapel; on either side are aumbries.

On the south side, under the middle window, are remains of an aumbry and piscina, and a little further west is the double sedilia, with a "dog-tooth" ornament in the cusped arches. The bases of the north arcade of the presbytery were brought to light during excavations made under the direction of the late Mr. R. Johnson, architect, of Newcastle.

At the outside of the east end of the choir is the Lady Chapel added in the fifteenth century. This chapel is supposed to have been attached to the priory as a place of interment for the Percy family; their armorial bearings, along with those of the See of Durham, being very prominent as terminations to the hood-moulding over the doorway. The chapel measures, inside, about 18 ft. 10 in. by 11 ft. 4 in., and is divided into three bays, with a semi-octagon vaulting shaft between each window, rising from the string-course under the window-sills. There is a stone seat on each side of the chapel. Above the arched recess over the altar-table is a small "rose window" of simple design, on each side of which are niches with cusped heads, intended for statuary. On either side of the altar are aumbries, and a small piscina is in the south wall.

The richly-vaulted roof is almost unique. At the intersection of the three longitudinal ribs with the transverse ribs are large circular bosses with representations of the Redeemer, Blessed Virgin, and Apostles, encircled by a label bearing an inscription. The emblems of the Evangelists and the Bannered Lamb are placed at the eastern and western extremities of the ribs; the smaller bosses bearing the sacred and other monograms, and the Rose and Sun. On either side of the "rose" window are figures representing the Annunciation, and over the entrance is carved Our Saviour seated with a figure, kneeling by his side, in supplication. The interior of the chapel is in very good repair, and the windows are filled in with modern stained glass.

Externally, an excavated area having been made on each side, the base-course and the lower part of the buttresses can be easily seen; the upper part of them has been cut away.

The jambs of the windows are the same section, both inside and out; but the first two, from the west on north side, differ from the others, and still remain walled up.

One bay of the south aisle of the choir still remains, with a portion of its vaulted roof, a large arch opening into it from the south transept. On the exterior face are the remains of wall arcading of the earlier Transitional work.

Some vaulted chambers on the south side are all that remain of the priory buildings, these being now used for military purposes.

Various parts of the interior of the ruins since the dissolution have been used for interments, and the cliff on the south and east sides of the priory is studded with hundreds of gravestones.

The incongruity of its former associations still continues; the monks have departed, and their beautiful monastery is now a crumbling ruin, surrounded on one side by barracks, and on the other by batteries of guns ready to deal death and destruction on the enemy from the sea-girt churchyard of Tynemouth Priory. E. R. T.

* Gibson.

CHURCH OF ST. BARTHOLOMEW, IPSWICH.

THE Church of St. Bartholomew, Ipswich, is now in course of erection in that part of Ipswich known as "California," on the top of Bishop's Hill. Only a portion of the church is to be built at present, including the chancel, the sacristy, and half the nave. The remainder of the nave, the tower, and the morning chapel will be built as soon as sufficient funds are forthcoming. The church is to be built of red brick, with Corsham Down stone dressings, and the nave arcade will be of the same material. The walls will be plastered internally, and a panelled dado of painted fir will run round the church as high as the cill of the aisle windows. The church will be lighted mainly by a large west window, which is the width of the nave, and runs up as high as the roof timbering will allow.

The accommodation is given on the plan attached to the drawing; the congregation will be provided with chairs.

The church complete is estimated to cost about 9,000*l.*, without furniture.

CHARLES SPOONER.

DESIGN FOR WINDOW, SOUTHPORT.

THIS window, the drawing of which was exhibited at the Royal Academy last year, was designed by Messrs. Shrigley & Hunt, for the Church of SS. Simon and Jude, Southport, though its execution has, owing to circumstances, been postponed. The design, as will be seen from the quotations on the scrolls introduced, illustrates the *Te Deum*.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir John Hutton, Chairman, presiding.

Evading the new Building Act.—On the report of the Building Act Committee, Major Probyn called attention to a recent letter in a daily newspaper in which it was alleged that the Council was endeavouring to evade the new Building Act in reference to what were known as the Drury-lane sites. He wished to ask the Chairman of the Committee whether there was any intention of evading the new law in the case in question.

Mr. Marsland, Chairman of the Committee, replied that there was no such intention.

Railway Stations in the County of London.—The Highways Committee recommended—

"That it be referred to the Parliamentary Committee to take the necessary measures for the introduction of a public Bill in the Session of 1896, for the following purposes:—*(a)* To give the Council,

for the purpose of enabling it to make representations under the Railway and Canal Traffic Act, 1888, power to inspect from time to time the stations of every railway company in the county of London; *(b)* To require each railway company, before constructing a new station or reconstructing or altering an existing station in the county of London, to submit plans of the proposed works to the Council for its approval; and *(c)* To prohibit the erection or alteration of any station otherwise than in accordance with plans approved by the Council."

Mr. Beresford Hope moved to refer the matter back. In his opinion the Council was not a proper body to be invested with powers of interference with matters of railway management.

After some discussion the recommendation of the Committee was agreed to.

Motive Power for new Tramway.—The report of the same Committee contained the following paragraph :—

"We have considered the application made by a company called the London United Tramways, Limited, which has acquired the undertaking of the West Metropolitan Tramways Company, for the Council's consent under the latter company's order of 1887, to the use of electricity by means of overhead wires as the motive power for working so much of the tramway in Uxbridge-road, between Shepherd's Bush Green and Acton, as is within the County of London. We have in connexion with this matter received deputations from the Vestry of Hammersmith, the road authority of the district, and from the company concerned, in support of the application. The company states that the proposed system is in operation in the most fashionable streets and boulevards in Brussels, Genoa, Florence, Havre, and other important Continental cities and towns, and is about to be adopted on some of the tramways at Bristol. The system involves the placing in the centre of the thoroughfares of columns with brackets, with bare copper wires stretched between them; and, having in mind the very decided opinion expressed by the Council some time since against the proposal to adopt the road-centre lamp system for the electric lighting of the Victoria Embankment, the system proposed by the company is, we think, not likely to find favour with the Council. The company urges in support of its proposal that these columns would be of an ornamental character, and could moreover be used for the street lanterns; but we are very doubtful as to the benefit to be derived from such an arrangement. Having regard to the policy which the Council has always adopted with respect to overhead wires, it appears to us most inadvisable that it should consent to the adoption, in any part of London, of a system involving the use of overhead electric wires for working tramways; and it is to be borne in mind that, should the Council consent to the adoption of such a system for tramway purposes, there would probably arise immediately a demand on the part of electric lighting companies to be allowed to place their wires overhead also, especially as no reason can be alleged against the adoption of that course which would not apply with equal force to the tramway wires. We recommend—

'That the consent of the Council be not given to the use by the London United Tramways, Limited, of electricity by means of overhead wires as the motive power for working the West Metropolitan Tramway in that portion of the Uxbridge-road which is within the county of London; and that the Board of Trade and the London United Tramways, Limited, be informed of this decision.'"

Mr. Beachcroft moved an amendment to the effect that the company should be allowed to make the experiment. The condition of London, which was far behind Paris with regard to locomotion, was absolutely blocked for want of some new invention dealing with the question.

Alderman F. Williams seconded the amendment. He did not see that the experiment was likely to be attended with either danger or inconvenience. He hoped that the fanatical cry about the beautification of London would not be carried to the point of absurdity, and to the disregard of the claims of obvious utility.

The amendment, after some discussion, was defeated, and the recommendation of the Committee was agreed to.

Local Sewers.—The Main Drainage Committee reported as follows :—

"We have sanctioned, subject to conditions recommended by the engineer, the construction of local sewers as follows—Strand: 120 ft. of 3 ft. 9 in. by 2 ft. 6 in. brick sewer in Hart-street. Fulham: 595 ft. of 12-in. pipe and concrete sewer in Kingwood-road, Fulham Palace-road. Poplar: 840 ft. of 12-in. pipe sewer in Shoot, otherwise Beechy-road, Bow. We have also renewed the sanction, given by us on December 15, 1892, and October 26, 1893, respectively, to the construction, subject to conditions, of the following local sewers—Hampstead: 375 ft. of 3 ft. by 2 ft. brick sewer and 600 ft. of 15-in. pipe sewer in Constantine-road, 383 ft. of 12-in. pipe sewer in Cressy-road, and 495 ft. of 12-in. pipe sewer in Mackerson-road. St. Saviour's: 475 ft. of 15-in. pipe and concrete sewer in Meymott-street, Blackfriars-road."

Competitive Designs for Working-class Dwellings.—The report of the Public Health and Housing Committee contained the following paragraph, the recommendation being agreed to.

"On April 17 last we were authorised to invite competitive designs from six specially qualified architects for the dwellings to be erected on a portion of section E of the Boundary-street area. We at the same time obtained authority to pay the sum of 50*l.* to each competitor, and to expend a further sum not exceeding 200*l.* for distribution among the competitors at our discretion. In accordance with these instructions we invited six firms of architects who have had large experience in the erection of working-class dwellings to send in plans, and all of them have submitted designs for the dwellings. We have carefully considered these designs, and are of opinion that the design submitted by Mr. Rowland Plumbe is the best, whilst those submitted by Messrs. Davis & Emanuel and Messrs. Joseph & Smithem are entitled to high praise. As all the competitors made a reasonable compliance with the terms of the competition, we have paid to each the sum of 50*l.*, and in addition to this amount we have awarded to Messrs. Davis & Emanuel and Messrs. Joseph & Smithem a further sum of 25 gs. each, in consideration of additional trouble to which they have been put in the matter. The competition being concluded, we considered whether the design which we had placed first could be recommended for adoption in respect of the site. We obtained a detailed report from the Council's Architect as to the merits and defects of the design, and we submitted this to Mr. Plumbe, who thereupon produced a plan which we felt justified in recommending conditionally for adoption. We have carefully considered the question of receipts and outgoings in connexion with these dwellings, and we are of opinion that if the buildings can be erected at Mr. Plumbe's estimate, the requirement of the Council that a return of 3 per cent. shall be obtained on working class dwellings may be complied with. It is, however, desirable that before the Council is definitely committed to the erection of the dwellings, quantities should be taken out, in order that we may rightly judge of the financial results of the plan, and we propose that one of the firms of quantity surveyors employed by the Council should be instructed accordingly. We estimate the cost of this to be about 250*l.* But, if it should appear upon the pricing-out of the quantities that the buildings cannot be erected for the sum which Mr. Plumbe estimates they will cost, we consider that the Council should not be committed to the adoption of the design or to payment to Mr. Plumbe in respect thereof. We recommend :—

"'That, subject to an estimate to be submitted by the Finance Committee, as required by the statute, the Committee be authorised to expend a sum not exceeding 250*l.* in taking out the quantities in respect of the plans prepared by Mr. Rowland Plumbe of the dwellings proposed to be erected on a portion of Section E of the Boundary-street area.'"

The Supervision of Bakehouses.—The Public Health and Housing Committee recommended that the Parliamentary Committee be instructed to prepare a Bill amending the law relating to bakehouses in London, in accordance with the Council's views (expressed in resolutions passed on June 26 and July 17 last).

The Ventilation of the Underground Railways.—The same Committee recommended "That letters be addressed to the Metropolitan and District Railway Companies, informing them that the attention of the Council has been directed to the need for improved ventilation of their tunnels, and asking whether the companies propose to take any steps in the matter."

This was agreed to.

Sanitary Inspectors.—The same Committee reported as follows, the recommendations being agreed to without discussion :—

"We have had under consideration a letter from the Sanitary Inspectors' Association calling attention to the proposal of the Hackney Vestry to pay to the sanitary inspectors they are about to appoint the inadequate salary of 91*l.* per annum, and asking the Council to make a representation to the proper authorities on the subject. The Association point out that 'by sections 100 and 107 of the Public Health (London) Act, 1891, the Council has power to see that the provisions of the Act are properly carried out by local authorities, and also to secure the appointment of a sufficient number of sanitary inspectors,' and they submit that 'in the interests of the public health, the sanitary inspectors appointed should be qualified men of ability and integrity, and that to secure the services of such men it is necessary to offer suitable remuneration.' The Council must bear in mind that the confirmation of the appointments of sanitary inspectors made under the Public Health (London) Act, 1891, rests upon the Local Government Board, which has power to deal with all questions relating to their qualification, appointment, duties, salary, and tenure of office. As, however, the Council has to pay one-half the salaries of all the sanitary inspectors appointed under the Act, it seems to us that it may properly express an opinion to the Local Government Board upon any question relating to such salaries. We are quite in sympathy with the views expressed by the Association, and having regard to the nature and responsibility of the work which devolves upon sanitary inspectors under various Acts of Parliament, we do not consider that the salary of 91*l.* per annum is an adequate one. We think the Council might with advantage communicate with the Local Government Board to that effect, at the same time expressing the hope that the Board will not sanction the appointments unless adequate salaries are paid. We therefore recommend—

'(*a*) That a copy of the Association's letter be sent to the Local Government Board, with an expression of the Council's opinion that the salary of 91*l.* per annum proposed to be paid to the sanitary inspectors about to be appointed by the Hackney Vestry is inadequate, and of its hope that the Board will not sanction the appointments unless adequate salaries are paid. (*b*) That the Association be informed of the course taken.'"

Architect for the Sixth Asylum.—The Asylum Committee reported that they had selected Mr. G. T. Hine, of 35, Parliament-street, S.W., as the architect for the new asylum.

Salaries for District Surveyors.—Lieutenant-Colonel Ford moved—"That it be referred to the Building Act Committee to consider and report on the expediency of arranging that all future district surveyors should be appointed at fixed salaries instead of being paid by fees." In the course of some remarks he said that, under the present arrangement, district surveyors were subject to influences which they would be free from if they were paid by fixed salary.

Mr. Emden seconded, but the motion was subsequently negatived, only seven votes being given in its favour.

After transacting other business, the Council adjourned.

COMPETITIONS.

BATHS, WALSALL.—At the last meeting of the Walsall Town Council competitive plans from the local architects for the proposed new baths were considered. The General Purposes Committee presented a report recommending the adoption of the plans marked A, providing first and second class swimming baths, Turkish baths, and twenty-five slipper baths, with engine-house, laundry, &c., at an estimated cost of 7,500*l.* The report was confirmed by the Council, and the authors of the selected design were found to be Messrs. Bailey & McConnal, of Walsall.

DARLINGTON NEW SCHOOLS.—In a limited local competition for the new schools for girls and infants of Holy Trinity parish, Darlington, the plans of Mr. G. G. Hoskins, F.R.I.B.A., have been selected, and have received the approval of the Education Department.

BOARD SCHOOL, WEST HARTLEPOOL.—The competition for a board school for about 1,450 children, Brougham-terrace, West Hartlepool, has just been decided as follows:—First premiated design, by Mr. E. Percy Huide, A.R.I.B.A., 17, Queen-avenue, Dale-street, Liverpool; second, Messrs. Simon & Tweedie, 36, Hanover-street, Edinburgh; third, Messrs. Brewill & Baily, Angel-row, Nottingham. The assessor was Mr. Mr. T. Mellard Reade, F.R.I.B.A., Liverpool.

Correspondence.

To the Editor of THE BUILDER.

INTERESTING DISCOVERY AT DURHAM CATHEDRAL.

SIR,—The enclosed cutting from a northern newspaper gives an account of the discovery by Canon Greenwell, F.S.A., of the precise termination, eastward, of Durham Cathedral, as shown by the foundations, just unearthed, of the lower portions of the walls of an apse at the end of one aisle :—

"During the present week an interesting discovery has been made at Durham Cathedral, which throws light upon what has long been a doubtful point with students of church architecture—the original form of the east end of the Cathedral as designed by Bishop Carileph, the seventh Bishop of Durham, who commenced the present structure in 1093. It has been generally admitted that Carileph's choir terminated in an apse, and the general idea was that the north and south aisles at each side of the choir continued around the apse of the choir in an ambulatory, but the discovery made this week upsets this theory, and establishes beyond a doubt the original design started by Bishop Carileph, which the present Chapel of the Nine Altars, erected by Bishop Pudsey about 100 years later, superseded. To the Rev. William Greenwell, minor canon of Durham, and a recognised

authority in church architectural matters, attaches the honour of making the discovery. Some men were engaged excavating in connexion with the proposal to introduce hot water heating apparatus into the Cathedral. They were at work at the east end of the southern aisle of the nave when Mr. Greenwell came upon them. Looking into the hole they had dug, he noticed that the outer wall against which they were working was ashlar faced, and thinking that this was strange in foundation work, he asked the men to dig a little to the east, when he discovered that the aisle had an apsidal termination, and did not form one side of an ambulatory as was generally believed. The discovery led to a similar excavation being made in the northern aisle of the nave, and this was also found to have an apsidal termination. The wall of the apse in each case is of immense thickness and solidity. It is curved in semi-circular form on the inside and square on the outer or eastern side, and measures from its curved face to the square face no less than twelve feet. Mr. Greenwell says the solidity of this foundation work implies a superstructure of heavy masonry, but as to what Carileph intended in this direction nothing is disclosed. The excavations are going on, and it is hoped that the apsidal end of the choir will also be discovered, and if that is done the ground plan of Carileph's design as regards the east end of the Cathedral will be complete."

It had always been supposed that the apse of the choir had been surrounded by an ambulatory, a theory adopted by myself in a paper read at Durham many years ago. (Yorkshire Architectural Society, Vol. XXIII.). It appears now to be established that the Romsey treatment of three apses was also that at Durham. And it further appears more than probable that these were not merely *intended*, but actually *built*, to some extent. The choir was the earliest-built part of the Cathedral, but there is no evidence that the northern builders of the early years of the twelfth century succeeded in finishing the vaulted roof.

E. R. ROBSON.

THE NEW DISTRICT COUNCILS AND THE PUBLIC HEALTH ACT.

SIR,—In your issue of the 12th ult., Mr. Thos. G. Jackson invites the opinions of your readers on the apparent eccentricity (for such it is) of the Wimbledon Local Board in enforcing, or neglecting to enforce, the provisions of their by-laws as to new streets and buildings, and more particularly as regards the open space at the rear of domestic buildings.

Mr. Jackson has quoted in paragraph 3 of his letter a portion of the by-law regarding open rear spaces, but if the by-laws of the Wimbledon Local Board are after the Model Series of the Local Government Board he would have done well to have added the following, which is a part of the same by-law, and appears in the Model Series:—"A person who shall make any alteration in or addition to, such building, shall not by such alteration or addition diminish the aggregate extent of open space, provided in pursuance of this by-law in connexion with such building, or in any other respect fail to comply with any provision of this by-law."

A similar provision to the above is found also in by-laws of an earlier date than those of the Model Series.

Perhaps your correspondent will satisfy himself on this point, as to whether such a clause exists, and if so, then the action of the Wimbledon Board in ignoring it is *remarkably eccentric*.

By-laws are unfortunately, however, not retrospective, and if perchance the main building was erected prior to the adoption of the building by-laws, the regulation as to the reservation of the open space will not apply. See Tucker (App.) *v.* Rees (Resp.), 7 Jurist, N.S. 629, where the court held that if a new by-law applied to open spaces belonging to old buildings it was bad.

As regards the question of what is a building within the operation of the by-laws, section 159 of the Public Health Act, 1875, provides that "the re-erecting of any building pulled down to or below the ground floor, or of any frame building of which only the framework is left, down to the ground floor, or the conversion into a dwelling-house of any building not originally constructed for human habitation, or the conversion into more than one dwelling-house of a building originally constructed as one dwelling-house only, shall be considered the erection of a dwelling-house."

The contention of the Clerk to the Wimbledon District Council, as laid down in his letter appearing in yours of the 12th inst., that the additions or alterations complained of do not constitute a "new building," is *inconsistent*, for if the additions were not recognised as a "new building," why were plans of the structures required submitted to the Board and approved? No approval was requisite or necessary. It would appear that the Board have stultified themselves by approving the plans, as by so doing they have tacitly admitted that the structure is a "new building."

It must, however, be admitted that the section in the Public Health Act as to what is to be deemed a new building is highly unsatisfactory, and the variable decisions thereon given in the law courts have made "confusion worse confounded." While the Wimbledon Board appear to have departed somewhat in this instance from, I believe, the fairly general practice of Local Authorities who look upon additions in the nature of the one in question as new buildings, it would not be an unmixed blessing if it resulted in drawing the attention of the Legislature to the defective wording of the section referred to, which is open to varied interpretations and results which are most unsatisfactory.

As Mr. Jackson points out in his letter, "If the Wimbledon Board is right, and any owner of an old building in suburban and rural districts may add to it what he pleases and how he pleases . . . blocking up the open space necessary for health and convenience, those who live among old buildings are in a pitiable case;" and there is much force in this contention.

The pity of it, too, is that while municipalities are yearly spending vast sums of money in clearing out rookeries on crowded areas, other rookeries are the while rapidly coming forward, and old houses are being robbed of means of ventilation by such methods as those now brought in evidence, and owing in large measure to the confused state of the law on the subject as to what is a "new building."

The Sheffield Corporation, as pointed out by Mr. Edward M. Gibbs in your last issue, have been prescient enough to discern the harm caused by the defective section of the Public Health Act, 1875, and additions to existing buildings are in their Special Act to be deemed new buildings.

Is it not highly necessary, in the interests of public health, that a short Act, amending Section 159 of the Public Health Act, 1875, should be passed, embodying the provisions of the Sheffield Act as to "additions"?

"A TOWN SURVEYOR."

SIR,—May I correct two errata in my letter of last week? The printer makes me say "as well as them," instead of "as well as they," and Mr. "Sewell" should be Mr. "Sewill."

T. G. JACKSON.

*** We must be allowed to say that Mr. Jackson's MS. furnished some excuse for both mistakes.—ED.

THE CAIRO MUSEUM COMPETITION.

SIR,—In the *Builder* of to-day there is an advertisement of the "jury" charged with the examination of the designs to be sent in competition for the new museum at Cairo. In it my partner, Mr. Somers Clarke, is described as "Member of the Society of Architects, England." As he is not a member of any society bearing that name or any like it, I shall be obliged if you will allow me space to correct the mistake. It probably comes of a misinterpretation of the initials F.S.A., which belong to him as a Fellow of the Society of Antiquaries of London.

J. T. MICKLETHWAITE.

January 26, 1895.

WEEKLY RAILWAY TICKETS FOR WORKMEN.

SIR,—I shall be obliged if you will allow me to place before your readers a matter of some importance to all engaged in the various branches of the building trades and executing contracts at some distance from their places of business.

It is frequently necessary to send men some few miles away by railway, and a great deal of the trouble and inconvenience caused by the daily doling out of railway fares and expenses might be avoided if the railway companies would issue weekly tickets to workmen instead of requiring them (as at present) to get tickets daily.

The system could be easily protected from abuse by the railway companies requiring workmen applying for weekly tickets to be provided with a certificate from their employers as to their *bona fides*.

If these workmen's weekly tickets at reduced rates were issued by the railway companies much time and inconvenience would be saved and the workmen (when working at short distances away) would be able to return to their homes in the evening instead of having often to put up with the discomfort of miserable lodgings.

The principle of issuing cheap weekly tickets has already been conceded and if this matter were taken up by the various associations connected with the building trades I feel sure the railway companies in granting this concession to a trade whose railway traffic is so important an item would see that this course would ultimately be an advantage to themselves as well as a great convenience to employers and employed alike.

THOMAS FLEWITT.

Nottingham.

CLEANING WHITE MARBLE.

SIR,—If one of your readers can give me a hint as to the best method of thoroughly cleansing a white marble mantelpiece I shall be much obliged.

J. S.

The Student's Column.

BRICKS AND TERRA-COTTA.—V.

COMPOSITION OF BRICK-EARTHS.

FROM what has been said concerning the origin of clays and brick-earths generally, it will not be difficult to understand that they vary exceedingly in mineral and chemical composition. These attributes will be dealt with more fully in connexion with the description of the bricks made in divers parts of the country, but it is profitable at this stage, for the purpose of considering brick-earths on the broad basis, to say something of the precise nature of the raw materials. And bearing in mind the important part played by chemistry, the microscope, and mineralogy in determining the various constituents we shall find it useful to dissect clays in the light of these branches of science. We shall consider the two last first, and take them both together.

General Observations. — Clays and brick-earths are made up, as a rule, of very fine particles of mineral matter, often so small that they cannot be seen with the naked eye. On using a lens the constituents are generally resolvable into two main parts, one being small granular fragments, and the other of such finely-divided matter as that the lens is incapable of sub-dividing it. For practical purposes, the proportion of gritty material can often be judged, by an experienced man, by merely rubbing a small sample of the earth between the thumb and forefinger. In the same way it is possible to ascertain, after a fashion, the sharpness or otherwise of the gritty constituent. As a rough and ready method, and in the absence of facilities for determining the nature of clays more precisely, this will do very well. But it cannot, of course, tell one the chemical and mineralogical attributes of brick-earths, which are the chief controlling factors in arriving at the method of preparing the raw earths, of burning or "firing" them, and ultimately of the quality of the finished product. In other words, it is quite possible to select an earth off-hand which will make a brick of some kind, but the precise quality of the brick thus produced must be largely left to chance. The lens carries us no further than the separation of the grosser from the finer particles. We now place a sample of the brick-earth under the microscope and, using a low power—say 3-in. objective—note that nearly all the larger fragments are crystalline, but that here and there small black pieces occur. Occasionally, portions of fossil-shell, highly comminuted, put in an appearance. By far the most abundant constituent, at least in most clays, is a finely impalpable mud, which the 3-in. objective is unable to satisfactorily determine. So far, our examination has not taught us much beyond the fact that the materials of which clays are made consist of sand particles, mostly crystalline, and another part which, for want of a better name, for the moment we will call mud. To further examine the sample from the mineralogical point of view two courses are now open to us: the first is to have a specimen prepared and ground down to transparency as far as possible, for examination by the microscope in transmitted light; and the second is to isolate the coarser from the finer grained constituents and examine each separately after their having been properly prepared as micro-slides. To explain this more fully we may give a few particulars as to the method of preparing the micro-slides. It must be remembered that the object is to obtain as thin a section of the material as is possible, so thin indeed that it may be placed between two pieces of glass the edges of which will practically touch. A piece of tissue paper is ever so much too thick to use as a simile, so also is gold-beaters' skin. To make this thin preparation, however, is not a very difficult matter, and the student, after two or three failures, will have gained enough experience to enable him to obtain a fair result. The sample of clay to be operated upon must be thoroughly dried by being placed in an oven, so that as much moisture as possible is driven off. It may then be pounded with a pestle-and-mortar, and reduced to a fine powder, afterwards being placed in a closed vessel in the oven to get rid of any further moisture. This latter is very important with some clays. Then the powder, being allowed to cool, is mixed with Canada balsam, with just enough of the latter to cement the particles together. The object of using Canada balsam is that it has practically no optical properties, is beautifully transparent, and colourless, matters of prime importance in examining sections in transmitted light. The

balsam and clay particles, when cold, will now have been converted into a hard piece of stone. From this, a thin slice may be cut, or a broad thin flake chipped off. The slice or chip may then be rubbed on water-of-Ayr or any other similar grinding stone until an even surface is produced, which may then be polished. When the clay sample contains very hard gritty matter it may be necessary to rub the slice or chip on a metal plate with the finest quality and grain of emery powder. The student is strongly advised not to resort to emery powder, however, until he is well-practised in the art of preparing these slides and knows something of the optical properties of clays, so as to be able to recognise any fragments of the emery that may have become accidentally incorporated with the slice during the grinding operation. After polishing one side of the slice, the polished face should be affixed to the slip of glass to form the ultimate micro-slide. In doing this, great care must be observed not to melt the Canada balsam forming the cement of the clay particles. A little experience with the balsam will teach the student much more than can be done by writing as to how this is to be accomplished, but according as the balsam is old or new, or is in hard chips or liquid, or is manipulated by the *preparateur*, so its general behaviour is controlled. The object is to melt as little balsam as possible on the glass slip, consistent with its being sufficient to cement the slice down, and it must not be made hotter than is absolutely necessary to do the work. At the same time the slice itself may be slightly warmed, though we have sometimes dispensed with this latter operation. Assuming the preparation has been successful up to this stage, we have now a slice of the clay cemented to a piece of glass, but the uppermost side of the slice is yet rough, and it is altogether too thick. The next thing to do is to grind this down, as before, and to keep on doing so until the merest film of the clay remains. This should then be polished, or if the preparation does not seem capable of withstanding this, a little Canada balsam may be run on to it, and to finish the process a thin cover-glass, to preserve the film, is then affixed. The final stages require the most care; it is very disappointing, after having carried the preliminary part successfully through, to make one unlucky turn at the finish and remove the whole film from the slip-glass. We have felt it necessary to go somewhat into detail concerning the preparation of micro-slides of clay, because the student will find it extremely difficult to get anyone to do the work for him, it being understood by so few of the usual mounters of micro-objects. Moreover, it saves expense and teaches a great deal to the student if he prepares his own sections, which, as we have before said, is not, after all, an insurmountable task.

So far, we have only disposed of the preparation of the slide for examination in transmitted light. We have now to separate the grosser from the finer particles in the sample of clay and to mount them. This is a comparatively easy matter with most brick-earths. The sample is securely tied up in a piece of linen or cambric and placed in a bowl of clean water, the whole being covered up to prevent dust from getting in. After a short time, when the clay has become thoroughly water-logged, the fine particles ooze out into the bowl and subside at the bottom. It may be necessary to leave the sample thus for a week or two, shifting it about now and then to facilitate its breaking up. At the end of that time the contents of the piece of cambric may be carefully washed, and it may be needful to do so in a sieve of extremely fine mesh. In an elaborate investigation sieves of different meshes can be employed to sort out the particles. Let us assume that the process has been carried out, the water in the bowl, after the last particles have subsided, is decanted off, leaving the impalpable mud as sediment. This may be placed in an oven to dry it, and then small portions may be mounted on black paper on a wooden micro-slide, or affixed to a piece of glass by means of Canada balsam. The grosser particles may be dealt with in a similar manner, and it is often useful, in addition, to prepare a thin micro-slide of them for examination in transmitted light. All is now ready for use with the microscope. We will first examine, in reflected light, the slide of prepared mud, with a $\frac{1}{4}$-in. objective. This is now seen to be made up of myriads of particles falling into two categories, the first consisting of crystalline particles, and the second of highly decomposed mineral matter, the nature of which it is not easy at first sight to determine. Examining the other slide of fine sediment in transmitted light we notice that the fresher or crystalline constituent is mostly orthoclase felspar,* if the brick-earth is brown the optical properties will be to some extent marked by reason of the iron to which the brown coloration is due having impregnated the felspar. All forms of iron are practically opaque in transmitted light. Minute particles of iron are also present in both the coarser and finer parts of the mud. Not the least abundant constituents of many brick-earths, even in microscopic particles, are flint and quartz. Leaving the mud for a moment, let us regard the slides of coarser fragments, both in reflected and transmitted light.

Here the microscope's function is threefold. It determines the relative abundance of the larger pieces, their shape and size, and mineral nature. The shape of the particles composing this sand will be seen to fall into five groups, which have been described by Mr. Sorby as follows:—

1. Normal, angular, fresh-formed sand, such as has been derived almost directly from the breaking up of granitic or schistose rocks.

2. Well-worn sand in rounded grains, the original angles being completely lost, and the surfaces looking like fine ground glass.

3. Sand mechanically broken into sharp angular chips, showing a glassy fracture.

4. Having the grains chemically corroded so as to produce a peculiar texture of the surface, differing from that of worn grains or crystals.

5. Sand in which the grains have a perfectly crystalline outline, in some cases undoubtedly due to the deposition of quartz upon rounded or angular nuclei of ordinary non-crystalline sand.

Of these, all kinds are fairly common in the earths used for brickmaking, except that falling into the fifth category. In brown brick-earths we not infrequently find the particles of sand coated with a film of iron. The foregoing observations do not take into account the nature of the black particles previously referred to; they turn out on investigation to be the seeds of plants, or fragments of lignitised wood. The shell fragments are mostly minute pieces derived from the trituration of larger shells, or they may be, in the case of a clay of marine origin, the whole tests of foraminifera. The advantage of a precise knowledge of the size and nature of the sandy portions of clays used in brickmaking will be very apparent to the student when considering the metallurgy of each kind of mineral found, the interdependence of one on the other in the firing process, and the influence of organic fragments on the whole.

* For a description of this and other minerals not described on the present occasion, the student is referred to the series of Student's Column articles on "Geology."—*Builder*, 1893, July—December.

GENERAL BUILDING NEWS.

ST. GILES PARISH CHURCH, NORTHAMPTON.—The peal of eight bells are being rehung at this church in a new iron frame, by Messrs. Taylor & Co., of Loughboro', and the clock is being restored and having Cambridge chimes fitted by Messrs. John Smith & Sons, Derby. The whole of the work is being carried out under the supervision of Mr. Holding, architect, of Northampton.

ST. PAUL'S CHURCH, MORLEY.—The new nave of St. Paul's Church, Morley, was consecrated on the 25th ult. by the Bishop of Wakefield. The edifice occupies the site of the old church, which was consecrated in 1877 by the Bishop of Ripon The church had only sittings for 275 persons. The building committee sought the advice of Mr. G. H. Fellowes Prynne, architect, of Westminster, who submitted a report to the effect that the old building could not be enlarged in any way to meet the requirements of the district. Mr. Prynne prepared plans of a new nave, with side aisles and transepts, to afford accommodation for 800 persons. The complete scheme, however, includes the erection of a chancel, a tower with spire, and a baptistery. The cost of the whole scheme is estimated at 10,000*l.*, and the cost of that portion which has just been completed is estimated at 6,300*l.* The new church is a stone building of the Early English Transitional period. The nave, which is entered under a massive archway, is lofty and broad, 95 ft. in length and 28 ft. in width, divided into five bays, the nave itself giving accommodation for 446 adults in front of the chancel and altar. The roof is of ribbed barrel-vault frame. Stone pillars support the arches of the nave, the main spandrels over the arcade being surmounted by clearstory quatrefoil windows. The north and south aisles abut against the three western bays of the nave, the northern aisle being reconstructed from the north aisle of the old church. The porch leading to this is the old porch rebuilt. A double transept is thrown out on either side, terminating in a chancel aisle. The north transept consists of a portion of the old nave, rebuilt in a new position, and terminates in choir-vestry and organ-chamber. A western exit is supplied to each transept. A clergy and choir-vestry, with a heating-chamber under, is placed at the eastern side of the choir-vestry, and is connected with it by a door, both entrances having separate entrances for a porch and to the church. The materials of the old church have been reused to the utmost possible extent. The seats in the nave and transepts consist of chairs. The hot-water system of heating the church has been adopted, the apparatus being supplied by Mr. de Ridder, of Liverpool. The tower has been designed to be placed at the south-west end of the south aisle, and it may be built, in future, without injury to, or interference with, the new church. The whole of the work in connexion with the erection of the nave has been carried out by Messrs. J. & J. Sugden. Mr. J. Wornell has been clerk of works, and Mr. R. H. Hale quantity surveyor.

NEW SHOW-ROOMS FOR THE GLOUCESTER RAILWAY CARRIAGE CO.—These show-rooms, which cost with the site about 7,000*l.*, have been erected on land at the corner of George-street and Northgate-street. The accommodation consists on the ground floor of one large show-room 77 ft. long by 38 ft. wide, fronting George-street and Northgate-street, another show-room opening out of this facing George-street, 58 ft. long by 19 ft. wide, a repairing shop in the rear of the smaller show-room, and a stable for the accommodation of two horses whilst carriages are undergoing light repairs. In the basement under the smaller show-room, is a cellar containing the heating apparatus, gas engine (by Messrs. Fielding & Platt), dynamo and storage batteries for supplying the electric light. The first floor of the building contains two large show-rooms, separated by rolling shutters. There is a carriage lift, capable of conveying large pantechnicon vans, communicating from the ground floor to the first floor. The buildings are built of local bricks, with Cattybrook facing-bricks against George-street and Northgate-street, with Bath-stone dressings, and the whole roof is covered with slate. The lift has been provided and fixed by Messrs. Waygood, of London; the heating apparatus for the whole building has been fitted up by Messrs. Haden & Son, of Trowbridge; and the rolling shutters by Messrs. Clark, Bunnett, & Co., of London. The whole of the excavation, brickwork, concrete, masonry, plumbing, granolithic and brick floors, has been done by Messrs. Gurney Bros., of Gloucester, and the carving was by Mr. Henry Frith; whilst the joinery work has been carried out by the Wagon Company's own hands, the whole having been executed to the design prepared by Mr. Walter B. Wood, architect, of Gloucester. The electric lighting arrangements have been carried out by Mr. Walton, the company's electrician.

INFANTS' SCHOOL, ST. STEPHEN'S MISSION CHURCH, BLACKBURN.—An infants' school was opened on the 19th ult., in connexion with this church, providing accommodation for 270 scholars, with separate babies' room at one end. An improved glazed folding partition divides the two classes of infants. At the main entrance there are cloak-rooms and lavatories, the inner walls being lined with white glazed bricks. The school is built with Yorkshire parpoints and dressings. The cost, including furnishing, is upwards of 1,000*l.* The whole of the work has been carried out by Mr. T. P. Wilson, of Lower Darwen, and local sub-contractors, under the superintendence of the architect, Mr. J. W. Shorrock, of Blackburn. Mr. Billington was clerk of works.

CLUB BUILDINGS, READING.—A new Liberal Club has been erected in Broad-street, Reading, and was opened on the 25th ult. In addition to the ground floor offices for the use of the Liberal Association, there is provided for the club proper a large entrance-hall, with tiled floor and stone staircase, refreshment-room about 20 ft. by 35 ft., billiard-room for two tables, and games'-room. The refreshment-room communicates with the kitchen on the second floor by a lift. On the first floor front is a reading-room occupying the whole of the frontage to Broad-street. At the rear of the reading-room is the smoking-room. Over the refreshment-room is a dining-room with lift. On the same floor there is also a billiard-room for one table. The second floor is occupied by kitchen offices, stewards' sitting-room, two private rooms for the club, bath-room for the use of members, &c. On the top floor are the bedrooms. There is a basement under the whole of the building. The whole of the premises are heated by hot water from a furnace in the basement. On the ground floor, but detached from the main buildings, and with a separate entrance from Cross-street, is the Cross-street New Hall, capable of seating about 250 persons. The Broad-street front is designed on free Classic lines, carried out in red Corsbill stone, Shap granite, and local grey brick. The buildings have been erected by Messrs. Bottrill & Son, the whole of the painting having been executed and glass supplied by Mr. H. Childs. The whole work has been carried out from the designs and under the superintendence of Mr. Wm. Galt Millar, of Reading, the architect.

MISSION CHURCH, RUSHDEN.—A mission church has just been erected at the Wellingborough end of the town of Rushden. The new building is dedicated to St. Peter, and is approached from the Midland and Station-roads. It is built from designs by Mr. F. E. Preston, architect, of Northampton-

shire stone, with Weldon stone dressings. The roof is of red Broseley tiles. There is only one entrance, which is by means of a porch at the north-west. At the east end there is a chancel, with a vestry and organ-chamber on either side. There are choir-stalls in the chancel, prayer-desks, and lectern, and at the west end there is a font, designed by the architect. The chancel will be screened off on week-days, and the rest of the room used for school and other purposes. Chairs are used for seating, and the room is heated by hot-water pipes. The builder is Mr. Robert Marriott, jun.

IMPROVEMENTS AT ST. MATTHIAS' CHURCH, TORQUAY.—During the last sixteen years many changes have been made in St. Matthias' Church, Torquay, mainly from designs of Mr. J. L. Pearson, R.A. Under this gentleman, a polished marble floor and dwarf screens have been placed in the chancel, and a sculptured reredos of alabaster reared in the eastern end. Further carved oak stalls, and a Bishop's chair, in like material, have been made and placed there by Mr. Harry Hems. The latest additions have been the raising of the fabric generally, and placing over it a roof, and lengthening the edifice westward. The contractors for this were Messrs. Bunning & Son, of London.

KIRKSTALL ABBEY.—The work of preserving the historic ruins at Kirkstall is expected to be completed before the close of the present year. The task which five years ago Mr. Micklethwaite undertook, has been fraught with many difficulties and dangers. When the abbey came into the possession of the Corporation it was in an extremely unsafe condition, and had not the contractors come to the rescue the ancient ruins must inevitably have come to the ground within a few years. The Kirkstall Abbey Committee have instructed the City Engineer to prepare an estimate for the cost of puddling the new lake in the grounds.—*Leeds Mercury.*

FREE CHURCH, EDINBURGH.—At the sitting of Edinburgh Dean of Guild Court on the 24th ult., warrant was granted to the Rev. W. Kilpatrick and others, Gorgie Free Church Trustees, to erect a new church and offices at Slateford-road. The church, which will stand in a triangular piece of ground at the junction of Slateford-road and Shandon-crescent, will, in style, be based on Scottish fifteenth-century work. The plans, prepared by Messrs. M'Arthy & Watson, Edinburgh, show a building measuring in extreme length in the interior 89 ft., and in width 51ft. It will provide sitting accommodation for 760 persons. At the entrance is a vestibule, and at the other end a session-room, vestry, and retiring-rooms are provided. The estimated cost of the church is 4,300*l.*

FOREIGN AND COLONIAL.

FRANCE.—The "Union Central des Arts Décoratifs" has opened a competition for the decoration of a room, to serve as an exhibit in the 1900 Exhibition. The same body is also organising an Exhibition of decorative work by women, to be opened on April 25.——The Municipal Council of Paris has under its consideration the establishment of a funicular railway from the Gare St. Lazare, following the line of the Rue d'Amsterdam, and ending on the summit of Montmartre.——The Municipality of Creil have opened a competition for a Hôtel de Ville.——A committee has been formed to raise a monument to Fourier, the socialist philosopher; either at Paris, where he died, or at Besançon, where he was born.——The Oriental Palace on the promenade at Nice has been enlarged by the addition of a Moorish salon, lighted by electricity, and opening on the large hall. The plans have been prepared by M. Vérany, engineer.——M. Osiris, who has made such noble use of his large fortune in benevolent schemes, has given 60,000 francs to the city of Nancy (to which he had already presented a statue of Joan of Arc) for the founding of a diphtheria hospital.——The preparations for the proposed scientific, industrial, and artistic exhibition at Bordeaux are in active progress. It is to occupy the square "des Quinconces," in the centre of the town. Opposite to what will be the principal entrance to the exhibition a large monument is in progress to the memory of the Girondin deputies who fell victims to the Convention. The monument, the joint work of M. Dumilâtre as sculptor and M. Rich as architect, will consist of a large double basin surrounded by steps, in the centre of which is a pedestal supporting a column carrying a statue of Liberty. The statues of the Girondin deputies will be grouped at the base of the column.——The death is announced, at the age of 75, of M. Chas. Ronot, painter, Director of the École des Beaux-Arts at Dijon. M. Ronot was a corresponding member of the Institut.——The death is also announced of a young painter of great promise, M. Charles Bitte. ——M. Roty, the medallist, has executed a pretty commemorative plaque in silvered bronze, to be distributed to those who exhibited in the French Section at the Chicago Exhibition. The design represents France in the guise of a female figure wearing a helmet, and stretching her arms towards a genius descending from a ship with an olive-bough in his hand. On the reverse is a cartouche, with symbolic decoration, bearing the name of the recipient.

GERMANY.—In the German Municipal Budget for 1895, which is now under consideration, the sum appropriated to scavenging works is 118,000*l.*, including an item of 5,000*l.* for snow removal.——Work is shortly to be commenced on the treatment of the open space in front of the Brandenburg Gate.——The casting of Begas' Emperor William monument has been entrusted in portions to three foundries; the size of the concern may be judged from the fact that over 34 tons of metal will be employed.——Telephonic communication between Berlin and Memel, a distance of 1,000 kilomètres, has now been established, *vid* Elbing. This is the longest line hitherto opened in Germany.——The University of Strasburg is to be provided with new medical schools, at a cost of 40,000*l.*——During 1894, the Baden *Limes* investigations, under Professor Schumacher, were directed to the ancient frontier between Jagsthausen and Miltenberg, and to the Mümling-Neckar line. On either side of Osterbürken, in the forest district, the line is clearly marked by dykes and ruined towers, but between Bofsheim and Walldurn, in an agricultural country, there are no traces above ground: excavations, however, revealed the frontier mark, thus confirming Herr Jacobi's discoveries in the Taunus Similar results were obtained on the Mümling-Neckar line, where in places the wall was superseded by a military road connecting the watch-towers. Traces of Roman villas were discovered at Tiefenbach and Bachenau, and a number of towers located between Neckarbürken and Trienz.——At the second meeting of the German Archæological Institute at Rome, Professor Mau lectured on the recent discovery of a Roman villa on the south slope of Mount Vesuvius, about a mile from Pompeii. The bath arrangements, including a boiler and series of pipes, are extraordinarily well preserved.

MISCELLANEOUS.

PATENT WIRE-GLASS.—A specimen has been sent to us of this glass, for roofing and flooring, made by the "Aktien-Gesellschaft für Glasindustrie," Dresden. The patent was introduced by Messrs. F. Siemens & Co., and consists in embedding a strong wire mesh in the middle of the glass in casting, thereby giving it much greater strength and elasticity. "There can," the patentees claim, "be no absolute breakage, as the interwoven wire will hold together the glass, when ordinary glass will break to pieces," and it is said to do away with the necessity for wire netting over skylights. No doubt if a weight fell on a skylight of this glass, the glass will not fall down in large pieces, as it is held up by the wire; but a wire *over* a skylight glass prevents the glass being broken at all, which is better. Moreover, in the case of a heavy weight, the wire would not hold this up, unless the outer strands of the wire mesh were left free of the glass and attached securely to the frame. For upright sheets of glass it must unquestionably be much stronger than ordinary glass of the same thickness, and probably it is, as the patentees say, nearly burglar-proof, as the wire cannot be cut by a diamond. That "the interwoven wire has hardly any influence on the transparency of the glass," is a vague and unscientific statement which we should hardly have expected to find in connexion with a patent connected with the name of Siemens. In the specimen sent to us the meshes are a little under $\frac{1}{4}$-in. square between the wires, and $\frac{1}{32}$-in. including the thickness of wire at each side; the precise amount of light intercepted is therefore an easy matter of calculation. It could not well be used where a good light was a necessity. It is however a useful invention for a good many purposes, and quite worth the attention of architects; only, as too often happens in circular recommendations of this kind, the patentees rather spoil their case by claiming too much for it. The London agent for the glass is Mr. L. Posse (Limehouse).

MONUMENT TO THE LATE BISHOP OF ST. ALBANS.—A monument has recently been placed over the remains of the late Bishop Claughton, who is buried in the graveyard adjoining St. Albans Abbey. It is recumbent in form, and is executed in granite and marble. The inscription is as follows:—"Sacred to the memory of Thomas Legh Claughton, D.D. Born 6th Nov. 1808; entered into rest July 25th, 1892. Vicar of Kidderminster 1841 to 1867; 97th Bishop of Rochester, 1867 to 1877; 1st Bishop of St. Albans, 1877 to 1892. *R.I.P.* 'I sleep, but my heart waketh.'—*Cant.* v., 2." This monument, erected by the late Bishop's family, is distinct from the diocesan monument about to be set up in the north transept of St. Albans Abbey, which consists of an altar tomb, or cenotaph, on which reposes a sculptured effigy of the late Bishop, in statuary marble. The cenotaph was designed by the honorary architect, Mr. J. Oldrid Scott, and is executed mainly in alabaster, enriched with marble inlays, shields with armorial bearings, &c., Mr. Forsyth, of Hampstead, being the sculptor of both monuments.

SANITARY INSPECTORS' ASSOCIATION.—In connexion with the course of lectures and demonstrations of sanitary officers arranged by the Sanitary Inspectors' Association, Mr. S. G. Fairchild, R.P.C., delivered his second lecture on "Details of Plumbers' Work," at St. James's Hall, on Saturday evening last. Mr. Thomas presided. Mr. Fairchild first explained some diagrams of plumbers' joints, both properly and improperly made, pointing out the good qualities on the one hand and the defects on the other. He next turned his attention to the fixing of lead pipes, showing the methods which should and should not be adopted. Dealing with the question of water-closets, he described some of the earliest forms of closet and the first water-closet patented, which was invented by a watch-maker in the year 1775. The valve closet of to-day, he said, was much the same as that invented by a cabinet-maker named Brammer in 1778; the improvements were in the details, the principles being exactly the same. Mr. Fairchild enumerated the several points which were absolutely requisite in the construction or selection of a water-closet apparatus, to make it sanitary, and he then proceeded to deal with several kinds of closet. Pan closets he described as one of the worst forms in common use, adding that all attempts to improve this apparatus had failed, although they were commenced one hundred years ago. He declared that the nature and operation of automatic waste-water flushing-closets were in direct opposition to the principles of sanitation. After referring to the difficulty of keeping twin closets clean, and to other disadvantages connected with them, he condemned the trapless closet. Wash-out closets next occupied the lecturer's attention, and these he considered an improvement on the "hopper" and several other forms. He next explained the principles of wash-down and syphonic closets, which he exhibited, and, with the aid of diagrams, described "The closet of the century." Valve closets, although expensive when thoroughly well made in every detail, were, he claimed, silent in action and very durable. Trough closets were to be condemned for use in schools, workshops, &c., unless there was a sufficient stream of water constantly flowing through; for schools and workshops Mr. Fairchild recommended a form of wash-down closet. He afterwards pointed out the characteristics of a good flushing-cistern, and further observations had reference to urinals, slop-sinks, baths, lavatories, sinks, cisterns, &c. Concluding, Mr. Fairchild read the ancient ordinance of the Worshipful Company of Plumbers—an exceedingly interesting document—and remarked that it was a great pity that the ordinances therein contained, with certain modifications consistent with the present times, could not be enforced throughout the country, especially those relating to masters and apprentices. A cordial vote of thanks was afterwards passed to Mr. Fairchild for his lectures.

STAINED GLASS WINDOWS AND PAINTED GLASS.—In the course of his second lecture at the Royal Institution on the 26th ult., on "Stained Glass Windows and Painted Glass," Mr. Lewis F. Day said that the twelfth and thirteenth century glaziers relied from the very first on the help of paint. However, when they worked in that greenish tint, which was the nearest they could get to white glass, the glazier for a while kept strictly to his glazing. With the *grisaille* began quite a new chapter in the history of stained glass, a chapter so called because the effect of the window, as the French term implied, was greyish. This was a very important phase in the art, not only from the beautiful work done in it, but because coloured glass grew, so to speak, towards the light. The first coloured windows were intense in colour, deep, rich, even heavy, and they struck a note distinctly solemn and well suited to the Mediæval church. As time went on the problem of the glazier was how to lighten his glass, and he got more and more light into the windows until white predominated. Then the point was how to reintroduce colour, and that of course was always the question in *grisaille*. Experts had divided Gothic art into three periods, but the less they had to do with arbitrary subdivisions of style the better. People were much too anxious to get a name for everything, and when they had a name by heart they fancied they knew all about it. The fashion of the so-called decorative period, when painting became a more important consideration than ever in stained glass, was naturalism. He did not think it marked much progress in design, still less in taste. It was a straying from the severity and good taste of one period without arriving at the freedom and attainment of the other. But in the worst times there were artists who proved themselves such in spite of their period. The lecturer also dealt with the development of larger and lighter windows, and the consequent further use of painting on glass, and referred in conclusion to subject and Jesse windows.

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.—The thirty-fourth half-yearly meeting of the National Association of Master Builders of Great Britain was held on the 22nd ult. in the Birmingham Council Chamber. There were eighty-six representatives present from various parts, including Birmingham, London, Liverpool, Bath, Bristol, Derby, Hull, Manchester, Salford, Huddersfield, Cardiff, Bolton, Crewe, Cambridge, Kidderminster, Preston, the Potteries, and other parts of Staffordshire. Mr. John Bowen (the President of the Association) took the chair, and after his address the report for the past half-year was presented and adopted. Mr. C. W. Green (the hon. treasurer) presented the balance-sheet, which showed the Association to be in a sound financial position. The officers were re-elected, as follows:—Mr. J. Bowen, President; Mr. T. F. Ryder (London) and

Mr. J. S. Jones (Liverpool), vice-presidents; Mr. C. W. Green (Liverpool), hon. treasurer; and Mr. W. H. Smith (Northampton), hon. auditor. The meeting concluded with a vote of thanks to the Mayor for the use of the Council Chamber and to the President for his services to the Association. It was decided to hold the next meeting at Leicester in July. At the Great Western Hotel, Colmore-row, in the evening, the delegates, with the members of the Birmingham Master Builders' Association, were entertained to dinner by the President of the National Association (Mr. Bowen) and the President of the Birmingham Association (Mr. T. Barnsley). The guests numbered about 140. The loyal toasts having been honoured, Mr. C. H. Barnsley proposed "The Army, Navy, and Volunteers," and Lieutenant-Colonel Stanley G. Bird and Major J. Barnsley replied. Mr. J. Bowen proposed "Our City," mentioning the public institutions as evidence of a healthy municipal enterprise. The names of the mayor and Alderman Edwards were coupled with the toast, and his worship, in replying, claimed sympathy with the builders from the fact that his father was engaged in that industry, and, he added, worked with their president at the bench. With reference to the city, he was proud of its institutions, and of the part he took in the erection of the Law Courts, the builder and architect of which were present. Alderman Edwards also said a few words in reply, and referred to the enormous progress made in the city during the last fifty years. Mr. W. Sapcote next gave the toast of "The Institute of British Architects and the Birmingham Architectural Association," remarking that in 1862, according to the Directory, Birmingham had 46 architects and 152 builders, while to-day the city had 111 architects and 343 builders. Mr. W. Henman, in replying, referred to the suggestion that every local governing body should have a department of works, and carry out its own building operations, as an eccentricity which became the follies of youth. In Birmingham the Corporation had wisely abandoned some of its infantile practices, and was to be commended for obtaining the services of a trained architect in important work instead of entrusting the design to the permanent staff. In this connexion he asked his hearers to bear in mind the result of the exquisite design of Mr. Aston Webb for the Victoria Law Courts. Mr. Aston Webb having added a few words in reply, the toast of "The National Association of Master Builders of Great Britain" was proposed by the President of the evening, and replied to by Mr. John Bowen. Mr. C. W. Green next gave "The Birmingham Master Builders' Association," to which the President responded, and the health of "Our Visitors" was given by Major J. Barnsley, and responded to by Mr. J. C. Holder and Councillor Parkes.

A CHURCH DESTROYED BY FIRE.—On Tuesday morning Whittington Parish Church, near Chesterfield, was completely burnt down. The fire, so far as could be ascertained, broke out in the vestry through the overheating of a flue connected with the warming apparatus. The reredos was cracked and broken, and when touched crumbled to pieces. One monument alone remains. This was on the west wall, to the memory of Elizabeth and John Dixon, of Whittington Hall. The damage is estimated at over 5,000*l.*, and is only partly covered by insurance. The most serious loss is the destruction of valuable books connected with the church and parish.

STAFF DINNERS.—The annual dinner of the members of Mr. Henry Tanner's department at H.M. Office of Works was held on the 25th ult. at the Victoria Mansions Restaurant, Victoria-street, S.W., at 6.30 p.m. In the unavoidable absence, through indisposition, of Mr. Tanner, the chair was taken by Mr. E. G. Rivers.——The heads of departments and the travellers of the firm of Messrs. Young & Marten, of Stratford, assembled at the Holborn Restaurant on the 19th ult., to meet the principals, the occasion being that of the first annual dinner. Owing to indisposition, Mr. H. H. Marten, the head of the firm, was absent. The chair was taken by the general manager, Mr. E. Montague Edwards, and the vice-chair by Mr. J. Johns. The toast of "The Firm" was proposed by Mr. Johns, and responded to by Mr. Edwards, who referred to the growth of the business and some of the large works in which the firm had been engaged. The toast of "The Dinner Committee" was submitted by Mr. Frank Marten, Mr. J. T. Emery replying. A musical programme was gone through during the evening.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—In our report of Mr. Nisbet Blair's paper (pages 66-67 *ante*) the word "not" was incorrectly inserted four lines from the end, reversing the meaning of the sentence, which should have read—"There were few who really understood the present difficulties who would agree" &c., instead of "would not agree." The insertion of "not" was a piece of gratuitous and perfectly inexcusable carelessness on the part of the printer, which unfortunately escaped our notice.

THE PHILÆ MONUMENTS.—Mr. W. E. Garstin will meet at Assouan on February 2 a committee composed of Professor Sayce, Messrs. Naville, Farmer, Hall, Somers-Clarke, Hogarth, and Captain Lyons, in order to take their opinion as to the best measures to be adopted for preserving such portions of the Philæ monuments as will be partially submerged by the modified scheme for the Nile reservoir. However great the necessity may be, it is a matter of general regret that the beautiful island of Philæ should be even partially submerged. —"*Times*" *Correspondent.*

EMANUEL SCHOOL, WANDSWORTH COMMON.—Last July the central light of the East window of the Chapel of this Institution was filled with stained glass, in memory of the Rev. Arthur Towsey, the late head-master. Since that time the present head-master, the Rev. A. Chilton, has collected a sufficient sum to fill the two side lights of the same window, thus completing it, to celebrate the tercentenary of the establishment of Emanuel College by Lady Dacre. The subject of the central light is the "Adoration of the Magi," above is a little choir of angels holding a scroll, inscribed "Emanuel, God with us." The light on the right has for subject, "Christ in the Carpenter's Shop," and the left-hand light contains "The Annunciation." The window has been executed by Mr. B. A. Lillie, from the designs and under the superintendence of Mr. F. Hamilton Jackson.

ELECTRIC LIGHTING OF ST. PETER'S CHURCH, EATON SQUARE.—The vicar and churchwardens of St. Peter's Church decided some time since to light the building with electricity, and at the same time to clean and re-colour the interior. The electric light has now been put in. The whole of the lights are subdivided among a number of small circuits, which are controlled by switches grouped at two points in the church and vestry respectively. The scheme of lighting is from the designs of Mr. W. Howard Tasker, Kensington, who prepared the plans and specifications, and under whose supervision the work was carried out. The contract was let to Messrs. Moody Bros., of Victoria-street, S.W.

LEGAL.

CASE UNDER THE NEW BUILDING ACT.

MR. CHARLES FORSTER HAYWARD, District Surveyor for the Parish of St. George's, Bloomsbury, was summoned on the 28th ult., before Sir John Bridge, at Bow-street, by the "building owners" of Bedford-court Mansions, who set forth in their information that the defendant had served them with notice of objection to the proposed erection of a certain building, and called upon him to show why the decision should not be reversed. Mr. Horace Avory appeared for the complainants; and Mr. Freeman, on behalf of the County Council, conducted the defence.

Mr. Avory explained that the object of the summons was to obtain the ruling of the chief magistrate as to the meaning of Section 212 of the new London Building Act of 1894, which came into operation at the beginning of the present year. In 1890 his clients entered into a contract with the then Duke of Bedford to take the lease of a piece of ground in what was now Tavistock-street, but which was at that time a mews, at a ground rent of 2,000*l.* a-year. They undertook to erect buildings on the land after taking down the then existing structures, and erect certain flats in accordance with plans approved by the Duke of Bedford or his representatives, and complete them before June, 1895. The building was to be erected in five blocks, subsequently modified to four. One block had been erected, and it was now proposed to go on with the erection of the other blocks, which were to form part of the same building, the elevations being continuous. The complainants had paid since 1890 2,000*l.* a-year for the land. They had given notice to the surveyor of their desire to finish the building, and he had intimated that it now came under the new Act. The importance of this to his clients was that under the new Act the Council could require a much larger area of air space in the rear of the buildings, than they could under the earlier Acts. Therefore, if the contention of the Council were good in law, the complainants would have to curtail the size of their buildings, and there would be a corresponding reduction in the rents to be obtained. There were two questions to be decided: (1) Whether the building the complainants proposed to erect was in progress when the new Act came into force at the beginning of the year, and (2) whether, supposing it was not a building in progress at the time, it was not a building which had to be carried out under a contract entered into before this new Act. In support of his argument Mr. Avory quoted the following sections of the Act (210): "A building, structure, or work erected or constructed before the commencement of this Act to which no objection could have been taken under any law then in force shall (subject to the provisions of this Act as to new buildings or the alterations of buildings) be deemed to be erected or constructed in compliance with the provisions of this Act." (Sec. 212) "Notwithstanding anything contained in this Act, a building, structure, or work which has been commenced before and is in progress at the commencement of this Act, or which is to be carried out under any contract entered into before the passing of this Act, may be completed subject to and in accordance with the provisions of the Acts relating thereto as in force immediately previous to the passing of this Act."

Evidence having been given as to the agreement between the complainants and the Duke of Bedford,

Mr. Freeman contended that the buildings it was now proposed to erect were new buildings under the new Act. It was quite true that block A had been erected, but that did not throw a protection over blocks B, C, and D. He submitted that they were separate buildings, and that the agreement between the complainants and the Duke of Bedford was not a contract within the meaning of the Act. It was obvious that the duke and complainant intended from the first to treat these blocks as separate buildings. Under the agreement block A was to have a lease given to it directly it was finished, and so on with the others.

Sir John Bridge remarked that there were two grounds on which Mr. Avory argued that he ought to give a decision in favour of his clients. The first was that the whole of these four blocks were one building which had been commenced, and was in progress at the commencement of this Act. He was inclined to think that Mr. Avory was wrong on that point, but it was not necessary to decide that. The great point to be decided was whether this was a work to be carried out under a contract passed before this Act. In his opinion it was, and the building came under the old Act. He must give to each word in the Act its ordinary meaning and its ordinary construction. It might have been better if the section he was asked to decide upon had been made clearer, but as he said before he could only give to words their ordinary construction, and his decision was in favour of Mr. Avory's contention.

Mr. Avory: I must ask for costs. We have had to come here for an interpretation of the County Council's private Act, and we prove to have been right.

Sir John Bridge said he did not think he could allow costs in a case of this kind.

Mr. Freeman intimated that the case would be taken to a higher court.

A BUILDER'S CLAIM FOR WORK.

THE case of Harris *v.* Murrell came before Mr. Justice Grantham in the Queen's Bench Division on the 26th ult., it being an action set down under Order XIV., brought by the plaintiff, a builder, for work done and materials supplied.

Mr. English Harrison appeared as counsel for the plaintiff, and Mr. Percy Gye for the defendant.

The plaintiff's case was that the work in question was done to the "Lion and Lamb" public-house in Deptford-yard, the defendant being the occupier of that house and also of the house adjoining. Notice having been served on the defendant under the Public Health Acts, requiring him to do certain sanitary repairs, he saw the plaintiff's son and gave him the order. The work was done and a bill was delivered which was afterwards divided into two, at the defendant's request, 70*l.* odd representing the sanitary work, and 29*l.* odd representing the structural work.

Mr. H. Harris, the plaintiff's son, proved the giving of the order by the defendant.

In cross-examination, he stated that the plaintiff was the agent of the freeholder, but the work in question had been done by Murrell.

At the end of the plaintiff's case Mr. Gye called the defendant, who stated that when notice was served on him he handed it to the plaintiff, as the lessor's agent, who said he would attend to it.

The defendant having called evidence as to the actual value of the work done.

Mr. Gye, on behalf of the defendant, urged that he was not liable for the structural repairs. The notice was handed to the plaintiff, who did the work in pursuance of his ordinary authority as the lessor's agent. The plaintiff had handed the defendant a bill for a lump sum, and then he had served his writ without letting the defendant know what items he was charging against him.

The learned judge, in giving judgment, said that he accepted the plaintiff's account rather than the defendant's, and therefore he would give judgment for the plaintiff for the full amount claimed, with costs.

CLAIM FOR QUANTITIES IN EXCESS OF TENDER.

THE case of Pink *v.* Warner, which was reported in last week's issue of the *Builder*, again came before Mr. Justice Grantham, in the Queen's Bench Division, on the 25th ult. The action, as already stated, arose out of certain errors in the quantities used in building a house at Compton, near Godalming, the plaintiffs being the executors of Robert Pink, the builder who built the house, and the defendants the executors of Miss Lindsey, for whom the house was built. When the case was before the Court on the last occasion, the hearing was adjourned in order that counsel for the defendants might consult their clients, with a view to some arrangement being come to. When the case was called on on the 25th ult., some discussion arose between counsel. It was then agreed that the matter should be referred to a surveyor, but some difficulty arose as to what the surveyor was exactly to do.

Mr. Gully said he was quite content that the surveyor himself should adopt whichever mode was the truest method of getting out of the difficulty. There was a certified bill of extras, and the surveyor could take that with him through the building and say if those extras were to be inserted in the quantities.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Infectious Diseases Hospital	Penzance Town Coun.	31*l.* 10s. 21*l.* and 15*l.* 15s.	Mar. 19
*Technical Institute and Public Library	Boro' of West Ham	250*l.*, 150*l.* and 100*l.*	May 1
*Schools	Portmadoc County Schools	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Brick and Pipe Sewer (2,000 yds.)	Burley-in-Wharfedale U.D.C.	A. B. Preston	Feb. 5
Schools, Wrecclesham, Farnham		W. J. Wells	do.
Sewerage Works, Bon Accord-square	Aberdeen T. C.	Wm. Dyack	do.
Two Lodges, &c.	Luton Town Council	*Official*	do.
Sewer and Drain, South-road	Dover Town Council	do.	do.
Chimney Stack at Electric Lighting Works, Crowlands	Southport Corp.	do.	do.
*Works and Materials	Westminster Vestry	G. R. W. Wheeler	Feb. 5 & 6
Sewers, York-road and Skegoniel-avenue	Belfast Corporation	*Official*	Feb. 6
*Road Materials	St. Saviour's Bd. of W.	do.	do.
Medical Wards at Infirmary, Aberdeen	.....	Smith & Kelly	do.
Two House, Cemetery-road, Barnsley	.....	Wade & Turner	do.
Porter's Lodge, &c. Beckett Hospital, Barnsley	.....	R. Dixon	do.
Additions, &c. to Schools, Snettisham, Norfolk	W. T. Brown	.....	do.
Road Metal, Birmingham	Warwickshire C. C.	J. Willmot	do.
Vicarage House, Blaenavon, Mon.	Rev. J. L. Clougher	E. M. B. Vaughan	do.
Sewers, St. Ninian's, &c.	Stirling Town Com.	W. Ronald	Feb. 7
Additions to Schools, Vron, near Wrexham	Brymbo School Board	W. Moss	do.
Road Works, Barrowdale-road, near Keswick	Cockermouth R.D.C.	J. B. Wilson	Feb. 8
Chapel, &c. Extension (Antley Wesleyan Chapel), Accrington	Rev. J. B. Jones	.....	do.
Re-building Business Premises, Front-street, Chester-le-Street	T. W. Rowe	H. T. Gradon	Feb. 9
Engine and Boiler House, &c. Wombourn	Bilston U.D.C.	Baldwin Latham	do.
Three Houses, Roundhay, Leeds	Sir J. Barran	W. Carby Hall	do.
*Broken Granite	Guildford Corporation	F. T. Maltby	Feb. 11
*Road Works	Hanwell U.D.C.	S. Barnes	do.
*Cast-iron Water Pipes	Lathom and Burscough U.D.C.	Wood & Brodie	do.
*Wrought Iron Fencing	Folkestone Corp.	*Official*	do.
*Enlargement, &c. of Fire Stations	London County Council	do.	Feb. 12
*Passenger Station, &c Maesteg	G. W. R. Co.	do.	do.
*Portland Cement, Ballast, and Pitchers	Borough of West Ham	L. Angell	do.
Additions, &c. to Schools, and Erecting House, Brynmawr	Llanelly (Brecon) Sch. Board	E. A. Johnson	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Hospital, Langley-park	Lanchester Joint Hospital Board	J. W. Rounthwaite	Feb. 2
Sewerage Purification Works, Tonacliffe, near Rochdale	Whitworth U.D.C.	H. L. Hinnell	do.
*Works and Materials	Parish of St. John's, Hampstead	*Official*	do.
Shops, &c. Treorky, Glamorgan	D. Morgan	J. Rees	Feb. 14
*Postmen's Office, Maida Vale	H. M. Works	*Official*	Feb. 15
Granite Road Metal, &c. Bedford	Bedfordshire C.C	do.	do.
*Brick Sewers	Rawtenstall & Bacup Joint Sewerage Com.	H. A. Cutler	Feb. 18
*Works and Materials	St. Mary (Battersea) Vestry	J. T. Pilditch	do.
*Cleansing and Repairs to Three Weighbridges	do.	*Official*	do.
*Works and Materials	St. Pancras Vestry	do.	Feb. 18
*Widening Line, Croydon	L. B. & S. C. Ry.	do.	do.
Iron and Earthenware Pipes, Oldham	Royton U. D. C.	do.	do.
Sewage Works	Brierfield (Lancs.) U. D. C.	J. T. Landless	do.
*Steel Footbridge and Approaches, Parliament Hill	LondonCountyCouncil	*Official*	Feb. 19
*Concrete Situ Paving at Schools	West Ham Sch. Bd.	Newman & Jaques	do.
*Furniture and Fittings at Schools	do.	do.	do.
Brick Sewers, Stoneclough, Lancs.	Kearsley U. D. C.	T. Nuttall	do.
*Wood Paving Works	Kensington Vestry	W. Weaver	do.
*Police Offices, Cells, Court, &c	Rotherham Corp.	R. J. Lovell	Feb. 20
*Works and Materials	Islington Vestry	*Official*	Feb. 21
*Gasfittings, &c.	do.	do.	do.
*Somerton, &c. Waterworks	Langport R. D. C.	J. T. Hawkins	Feb. 22
Schools	Bourne (Lincs.) S. B.	*Official*	Feb. 21
*Sewerage Works	Uckfield U.D.C.	W. W. Gale	Feb. 25
Iron Girder Bridge, Argory, Armagh	.....	Dickinson & Dorman	Mar. 1
*School and Residence	Ashford School Board	H. J. Jeffery	Mar. 4
Enlargement of Town Hall	Cowbridge (Glam.)T.C.	C. B. Fowler	No date
Post Office House, Accrington	E. Riley	Heywood & Harrison	do.
House, Valley-road, Harrogate	J. H. Wilson	H. E & A. Bown	do.
Shops and Offices, Wheelergate, Nottingham	Nottingham Real Estate Invest. Co.	.....	do.
House, Langley Mill, Nottingham	.....	John Howitt	do.
Eight Houses, Darnall, Sheffield	.....	Marshall & Turner	do.
	.....	J. P. Earle	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Foreman	Mile End Old Town Vestry	3*l.*	Feb. 2
*Valuer	Richmond Union	120*l.*	Feb. 6
*Surveyors' Assistant	Grays Thurrock U.D.C.	2*l.* 2s.	Feb. 8
*Assistant Surveyor	Kettering U. D. C.	100*l.*	Feb. 9

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv., vi., viii., x., *and* xxiii. *Public Appointments, p.* xxi.

Mr. Bousfield: This work was to be done for a lump sum, but all extra work was to be done according to the bill of prices.

Mr. Gully: These prices, my lord, are prices upon which the estimate has been made out.

The Judge: You state, Mr. Gully, that the contract was based upon schedule prices.

Mr. Gully: We agreed to do it for 3,798*l.*

The Judge: I think the best way will be for the surveyor to say what quantities should be inserted in the contract, and what payment should be made to plaintiffs, on the assumption that the quantities had been incorrectly inserted, and what extras were done under the orders of the defendants.

Mr. Gully: He must look at the building.

The Judge: Of course he must.

Mr. Gully: I would mention a very well-known surveyor—Mr. Shoppee—to act in this case.

Mr. Bousfield: We have no objection to Mr. Shoppee.

The Judge: I know Mr. Shoppee; he is a man of the highest character. Then I will refer it to him.

Mr. Bousfield: It would be a great convenience to us to stay execution in order that we may take the case to the Court of Appeal on the question of principle. Our case is that your Lordship has no right to revise these quantities at all.

Mr. Gully: Your Lordship has the power to order an investigation of accounts, and your Lordship has exercised that power. Your Lordship will give judgment on the report made to you by the surveyor, Mr. Shoppee, and then that will be the proper time to raise this question of appeal.

The Judge: I think that would be the proper time.

Mr. Bousfield: But we have your Lordship's decision on the principle now.

The Judge: I really cannot do it now, and I think the executors will be ill-advised if they do appeal. I shall not grant a stay at this moment.

Accordingly, the matter was referred to Mr. Shoppee, who would have every opportunity for examining the house before reporting, both sides to be represented at the examination, with liberty to apply to the judge in case of any difficulty.

LONDON COUNTY COUNCIL *v.* GLUCKSTEIN.

On the 21st ult., at the North London Police-court, the adjourned case of the "London County Council *v.* Gluckstein" was heard. The summons was against Mr. Gluckstein, who is a builder, of Tottenham-court-road, for erecting a temporary timber stage without the consent of the London County Council, or in conformity with the Metropolis Building Act. Mr. Chilvers appeared for the London County Council, and Mr. R. C. Glen for the defendant. The point of contention was as to whether it was a permanent or a temporary structure; and surveyors were called on either side giving opinions *pro* and *con*. Mr. Berry, for the London County Council, said the structure was so roughly put up that it might have been done by a hedge carpenter, and, with the quality of the timber used, did not think it could last more than fifteen years; whereas his estimate of a permanent structure was a life of 100 years. Mr. J. Webster, A.R.I.B.A., said he was called by the defendant to survey the structure, which he found supported by stout uprights, sunk 4 ft. into the ground, and resting upon about 2 ft. of concrete, the uprights being properly creosoted. All the timber was strongly spiked together; and he was of opinion that the stage in question would last thirty years, and much longer if repaired. Mr. Chilvers submitted that, if this were intended as a permanent structure, the timbers would have been mortised together, and bound with iron. Mr. Lane replied that this was not necessarily so. He remembered having been engaged in a dispute as to the building of a jetty, and in the case one of the most eminent of surveyors, who was called in as arbitrator, said that in rough work it was not necessary to employ joiners to do mortising, the only essential being the butting and spiking together, as had been done in this case. Putting all the evidence together, he came to the conclusion that this was a permanent structure within the meaning of the Act, and dismissed the summons.—*Islington Gazette.*

COTTER *v.* HOLLAND & HANNEN.

In the Westminster County Court, on the 21st ult., before his honour Judge Lumley Smith, Q.C., the case of Cotter *v.* Holland & Hannen was heard.

In opening the case for the plaintiff, Mr. W. M. Thompson, barrister, told the jury that the action was brought under the provisions of the "Employers' Liability Act." The accident in respect of which this action was brought took place on July 26, last year. The defendants at that time were the principal contractors in connexion with some very extensive building operations which were being carried out at the Holborn Restaurant, and the plaintiff, who was a man of mature years, was engaged as night watchman. In that capacity it was part of his duty to go down into the basement for the purpose of putting out the lights and performing other duties, and in order to get down he had to descend by means of an iron ladder which was standing in an aperture where it was intended to erect a lift. Prior to the date of the accident he had gone up and down in perfect safety, but on the night in question, upon getting to the bottom of the ladder, instead of stepping on to firm ground, as he expected to do, he was precipitated into a hole, or trench, which had been excavated by some of the defendants' men during the day, and of which no notice had been given to him. The result was that he was thrown violently into the hole and sustained severe injuries, and for four months he was unable to earn anything, and even now he suffered more or less from the effects of the injuries.

The plaintiff was called and gave evidence to the above effect. In cross-examination he said that the ladder in question had been used by most of the men as a means of access to the basement, and he did not remember having been told to go down by a proper staircase which was provided for the purpose. His impression was that the ladder was the proper means of getting up and down to the basement.

For the defence, Mr. Ruegg, barrister, submitted that there was no case to go to the jury, inasmuch as it was perfectly clear that the plaintiff had himself been guilty of negligence in making use of the ladder when there was a staircase provided for the purpose of going up and down in perfect safety.

The defendants' foreman was then called, and stated that the ladder in question had only been placed in its position on the day preceding the accident, and was never intended to be used by the plaintiff or anyone else as a means of going into the basement, but was to be used in connexion with a lift which was in course of construction. There was a proper staircase for the purpose of going up and down, and had the plaintiff used it, as he should have done, this accident would never have happened. The plaintiff was perfectly well aware of the existence of the staircase, as it had been specially pointed out to him as being the way into the basement, and it was quite on his own account that he chose to go down the ladder instead of going down the proper way.

Several other witnesses were called in support of the foreman's statements.

His Honour, in addressing the jury, said it was quite clear from the evidence that a staircase was provided for the purpose of getting down to the basement, and that being so, it was rather difficult to understand why the plaintiff should have preferred to use the ladder, unless it was that it was less trouble to go down that way than it was by the proper staircase.

The jury retired for about a quarter-of-an-hour, and returned into Court with a verdict for the defendants, and his Honour entered judgment accordingly.

MEETINGS.

FRIDAY, FEBRUARY 1.

Architectural Association.—Mr. W. S. Weatherley on "Architectural Perspective." 7.30 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Mr. J. Castell-Evans on "Physics and Chemistry." I.: "Mechanical Physics." 8 p.m.

SATURDAY, FEBRUARY 2.

Architectural Association.—Spring visit to the Church House, Dean's Yard, Westminster. 3 p.m.

Royal Institution.—Mr. Lewis F. Day on "Stained Glass Windows and Painted Glass." III. 3 p.m.

Sanitary Inspectors' Association.—Twelfth Annual Dinner, Holborn Restaurant. 6 p.m.

London and Provincial Builders' Foremen's Association.—Monthly Meeting, Memorial Hall, E.C. Mr. Geo. Barclay on "Roofs and Roof Construction." 7.30 p.m.

Queen's College, Cork.—Mr. Arthur Hill on the "History of Architecture." IX. 3 p.m.

SUNDAY, FEBRUARY 3.

South Place Institute.—Mr. C. Hurley on "Municipal Labour." 4 p.m.

MONDAY, FEBRUARY 4.

Royal Academy.—Professor Aitchison, A.R.A., on "The Advancement of Architecture." III. 8 p.m.

Surveyors' Institution.—Adjourned Discussion on Mr. H. Blackbourn's paper on "The London Building Act, 1894." 8 p.m.

Clerks of Works' Association.—Annual Dinner, Holborn Restaurant. 6 30 p.m. Mr. F. C. Penrose (President, Royal Institute of British Architects) in the chair.

Architectural Association Camera Club.—Mr. W. J. Ramsey on "The Eastman Photographic Papers." 8 p.m.

Society of Engineers.—(1) Presentation by Sir Robert Rawlinson of Premiums awarded for Papers read during last year. (2) Inaugural Address by the President, Mr. W. G. Peirce. 7.30 p.m.

Architectural Section of the Glasgow Philosophical Society.—Mr. James Paton on "Mosaics." 8 p.m.

TUESDAY, FEBRUARY 5.

Institution of Civil Engineers.—Mr. John Richardson on "The Mechanical and Electrical Regulation of Steam-Engines." 8 p.m.

Society of Arts (Applied Art Section).—Mr. Gleeson White on "Drawing for Process Reproduction." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Mr. J. Castell-Evans on "Physics and Chemistry: Natural Forces."—II. 8 p.m.

Society of Biblical Archæology.—8 p.m.

Royal Victoria Hall (Waterloo Bridge-road).—Sir Colin Scott Moncreiff on "Egypt and the Nile." 8 p.m.

Northern Architectural Association.—Fifth annual social gathering of the Students' Sketching Club, at the Grand Assembly Rooms. 8 p.m.

Glasgow Architectural Association.—Mr. R. W. Horn on "The Development of School Planning." 8 p.m.

WEDNESDAY, FEBRUARY 6.

Royal Archæological Institute of Great Britain and Ireland.—(1) "Notes on an Elizabethan Armourer's Album," by Viscount Dillon. (2) "A Brass from Ightfield, Shropshire," by Mr. Mill Stephenson, F.S.A. 4 p.m.

British Archæological Association.—Rev. W. Sparrow Simpson, D.D., on "The Head of Simon of Sudbury, Archbishop of Canterbury." 8 p.m.

Society of Arts.—Mr. Geoffrey Drage on "The Labour Question in the Colonies and Foreign Countries." 8 p.m.

Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of members. 8 p.m.

Northern Architectural Association.—"An Evening with Notes," with Limelight Illustrations, by Mr. J. T. Cackett. 7.30 p.m.

Carlisle Architectural, Engineering, and Surveying Association.—Mr. A. Wilson on "Manufacture of Iron and Steel."

Liverpool Engineering Society.—8 p.m.

Edinburgh Architectural Association.—Mr. Percy Fitzgerald, M.A., F.S.A., on "Adam Architecture in London." 8 p.m.

THURSDAY, FEBRUARY 7.

Society of Antiquaries.—8.30 p.m.

Royal Academy.—Professor Aitchison, A.R.A., on "The Advancement of Architecture." IV. 8 p.m.

FRIDAY, FEBRUARY 8.

Institution of Civil Engineers (Students' Meeting).—Mr. C. H. Godfrey on "The Construction and Maintenance of Roads." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Mr. J. Castell-Evans on "Physics and Chemistry: the Atmosphere; its Physical Properties." III. 8 p.m.

SATURDAY, FEBRUARY 9.

Queen's College, Cork.—Mr. Arthur Hill on the "History of Architecture." X. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,879.—BUILDING WALLS, CONDUITS, &c.: *O. B. Schmall.*—This patent relates to the peculiar construction of building blocks in combination with means for binding them together in walls, conduits, or allied structures. The objects are (1) To secure the structures against the percolation of water or gas, (2) to strengthen the structure by throwing the lateral wall strains on the body of material instead of on the bonding cements, and (3) to provide a building block of plastic material which can be manufactured with a minimum of hand labour and cured and burned with a minimum of loss in curing and burning.

1,944.—HANGING SASHES: *S. Hambly.*—According to this invention a knot of the sash-line has merely to be tied and slipped into a hole or chamber at each end of the sash, and the cord falls into a groove extending from the hole to the top of the sash. When it is required to remove the sash from the frame and the cord from the groove it at once liberates the sash.

3,513.—SANITARY DRAIN-PIPES: *M. T. Fitzpatrick.*—According to this invention the internal shoulder of the flanged end of the pipe is chamfered, and a corresponding bevelled or tapered edge is formed on the free or penetrating end. When one pipe is inserted in the other, a level bore or running surface is ensured, the lip or raised edge on which the penetrating pipe partly rests, facilitates the introduction of the cement in the act of sealing the joint.

3,823.—WINDOW-SASHES: *M. Brooks.*—To dispense with sash-cords, counterpoise weights and pulleys for sashes are so arranged as to be readily cleaned from the inside, a system of racks and slots allow each sash to fall outwards as a louvre.

3,885.—AIR BRICKS: *S. E. Wynn.*—An air brick is provided with a vertical cross slit communicating at its outer end with a longitudinal passage, narrower at the centre and wider at the two outside openings.

NEW APPLICATIONS FOR LETTERS PATENT.

JANUARY 14.—839, C. Billington, sen., and J. Newton, Metallic Dies for making Dovetail or Under-cut Recesses in the Backs of Tiles or the like.—837, A. Watt, Direct Combustion, Smoke-consuming Furnace, and Fireplace Back.—853, J. Duckett & Son, Lim., J. Duckett and A. Ashworth, Water-closets.

JANUARY 15.—901, J. Walmsley, Detachable Cast-iron Fire-back.—908, T. Woodhouse, Syphon Cisterns.—926, G. Holloway, Ventilating Grate for Drains, &c.—936, A. Platt, Ceiling Protector and Ventilator.—937, J. Rohde, Combination Window-sash Fasteners and Draught Excluders.—984, C. Phillips, Fastener for Doors, Sashes, Frames, &c.—998, J. Hornby, Pipe Connexions.

JANUARY 16.—1,049, J. Walker and others, Floor, Sash, and Bench Cramp.—1,059, S. Baines, Sliding Window-sashes.—1,092, C. Major, Fireproof and Ventilating Floors.

JANUARY 17.—1,107, S. Firth, Fire-grates.—1,124, J. Rickard, Dovetail-cutting Machine, Mitreing Machine, and Squaring Machine combined.—1,136, J. Houghton and others, Windows.—1,165, H. Armytage, Fireproof Shutters.—1,167, C. Brix, Artificial Stone.—1,173, E. Bonson, Fireproofing System for Floors, &c.

JANUARY 18.—1,184, G. Newman, Floor Door-springs and Checks.—1,191, J. Taylor, Centre-pieces for Ceilings.—1,200, S. Adams, Flushing and Ventilating Sewers, &c.—1,228, J. Jonas, Chromatrope-like Room-ventilator.—1,247, A. Bartlett, Attachment for Ladders.—1,256, R. Hitchins, Machinery for producing Slabs of Plaster, &c.

JANUARY 19.—1,285, W. Speirs, Windows.—1,302, W. Warwick, Slabs or Panels formed of Fibrous Plaster and other Composite Substances.—1,337, F. Kitto and W. Haworth, Bricks, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

23,819, G. Bristow, Surveyors' adjustable Centreing-rod.—24,171, W. Youlten, Weather Checks.—24,382, L. Janlet, Flushing Tanks.—24,383, L. Janlet, Automatic Flushing Tanks.—24,503, W. Miller, Sinks.—24,581, G. Crosler, Interceptors or Sewer Traps.—24,664, H. Francis, Appliances for Holding Windows and Preventing Rattling.—24,775, F. Ballard and S. Lloyd, Chimney Cap.—24,917, J. and W. Sherman, Flushing Cisterns.—24,946, G. Warren, Kilns.—24,952, W. Tomlinson, Fastening Plates Together.—24,969, J. Johnson, Wood-working Machines.—25,088, J. Potter, Automatic Door-closer and Hinge combined.—25,253, W. Fowler, Sash-cord Fastener.—25,282, J. Weldon, Retaining Window-sashes in any position.—25,366, T. Banks, Fireproof Partitions.—54, G. Chisholm, jun., Sanitary Pipes.—63, A Boult, Joints for the Planking of Wooden Structures.—99, W. Warner, Double-trapped Gulleys.—108, J. Osman, Continuous Firing Kilns.—116, C. Pryce, Prevention of Scum, &c., on Terra-cotta and other Clay Goods.—186, G. Brown, Windows.—416, The Adamant Company, Limited, and J. Wilkinson, Fireproof Flooring and Ceiling.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.

18,773, W. Glass, Mitre-cutting Machine.—23,666, C. Fowler, Cutting Tool for Lead Pipe, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JANUARY 21.—By *Elliott, Son, & Boyton:* 42, Epple-rd., Fulham, u.t. 93 yrs., g.r. 5*l.* 10s., 390*l.*; 2, Castlenauter., Barnes, u.t. 44 yrs., g.r. nil., 395*l.*; "Ethelbert House," Merton-rd., Wimbledon, f., 375*l.*—By *Henry & Latchford:* 8, Cedars-rd., Clapham, f., 1,990*l.*

JANUARY 22.—By *Debenham, Tewson, & Co.:* "The Skinners' Almshouses," Mile End-rd., f., area 10,850 ft., 3,000*l.*; 82, Fenwick-rd., Peckham, u.t. 78 yrs., g.r. 8*l.* 10s., r. 40*l.*, 400*l.*; 70, Fenwick-rd., u.t. 78 yrs., g.r. 7*l.*, 275*l.*; 34, Delaford-st., Fulham, u.t. 86 yrs., g.r. 5*l.* 5s., 180*l.*

JANUARY 24.—By *C. C. & T. Moore:* 4, 6, and 10, Court-st., Whitechapel, f., 555*l.*; 140, Deptford-rd., Deptford, f., r. 33*l.* 16s., 365*l.*; 15 and 17, Moody-st., Mile End, f., r. 53*l.* 6s., 530*l.*; 7 and 15, Florisham-st., u.t. 49 yrs, g.r. 9*l.* 15s., 285*l.*; 242, Mile End-rd., u.t. 195 yrs., g.r. 28., 450*l.*; 57 and 59, Victoria-st., Stratford, f., r. 52*l.*, 460*l.*; 50, 52, 54, and 56, Temple-st., Hackney, u.t. 11 yrs., g.r. 22*l.* 10s., r. 109*l.* 4s., 175*l.*; 210 and 216, Victoria Pk.-rd., u.t. 71 yrs., g.r. 9*l.*, r. 59*l.*, 515*l.*; 13 and 14, King John-st., Stepney, u.t. 49 yrs., g.r. 7*l.* 10s., 340*l.*; 45 to 50, Crozier-ter., Homerton, u.t. 67 yrs., g.r. 16*l.* 10s., 560*l.*—By *J. T. Ayton:* 1 to 6, Lomas-bldgs., Stepney, f., 155*l.*; 49 and 51, Grafton-st., Mile End, u.t. 55 yrs., g.r. 9*l.*, r. 64*l.*, 610*l.*; 305, Mile End-rd., u.t. 62½ yrs., g.r. 7*l.*, r. 45*l.*, 490*l.*—By *Stimson & Sons:* 11 and 13, Currie-st., Nine Elms, u.t. 37 yrs., g.r. 8*l.*, 190*l.*; 40 to 48 (even), Olney-st., Walworth, u.t. 21 yrs., g.r. 19*l.*, r. 158*l.* 8s., 610*l.*; 65 to 73, Marlborough-rd., Old Kent-rd., f., r. 153*l.* 8s., 1,570*l.*; 19 and 21, Cooper's-rd., u.t. 20 yrs., g.r. 6*l.* 8s., 250*l.*; 127, 133, and 135, Coburg-rd., u.t. 28 yrs., g.r. 33*l.*, 160*l.*; 51, Goldie-st., u.t. 33 yrs., g.r. 2*l.*, r. 27*l.* 6s., 110*l.*; 59 and 61, Trafalgar-rd., u.t. 15 yrs., g.r. 6*l.* 6s., r. 56*l.*, 195*l.*; 78, Page's-walk, Bermondsey, u.t. 17 yrs., g.r. 3*l.* 15s., 105*l.*; 94, Blake's-rd., Peckham, u.t. 69 yrs., g.r. 4*l.*, 150*l.*; 20, Sumner-rd., u.t. 66 yrs., g.r. 2*l.* 10s., r. 35*l.* 2s., 320*l.*; 173 and 175, St. George's-rd., u.t. 67 yrs., g.r. 5*l.*, 630*l.*; 185, St. George's-rd., u.t. 67 yrs., g.r. 5*l.*, r. 32*l.*, 250*l.*; 20, Neate-st., Camberwell, u.t. 15 yrs., g.r. 3*l.* 10s., r. 33*l.* 16s., 95*l.*; 3, 4, 7, and 8, Arlington-grove, u.t. 38 yrs., g.r. 12*l.* 5s., 510*l.*; 25, Brunswick-sq., u.t. 43 yrs., g.r. 10*l.*, 250*l.*

JANUARY 25.—By *Toplis & Harding:* 113, High-st., Watford, f., r. 160*l.*, 4,100*l.*—By *Ball, Norris, & Hadley:* No. 116, Haverstock-hill, u.t. 54 yrs., g.r. 5*l.*, 1,050*l.*; 39, St. George's-sq., Belgravia, u.t. 35 yrs., g.r. 15*l.*, 650*l.*; "Flamstead House" and Cromwell Villa, Cheshnut, Herts, f., r. 70*l.*, 1,140*l.*; "The Laurels," and cottages adjoining, f., r. 48*l.* 2s., 650*l.*; 20, Wilmington-sq., Clerkenwell, u.t. 21 yrs., g.r. 1*l.*, r. 60*l.*, 300*l.*; i.g.r. of 20*l.*, Tysoe-st., u.t. 21 yrs., g.r. 2*l.*, 175*l.*; i.g.r. of 40*l.*, Shirlock-rd., Kentish Town, u.t. 82 yrs., g.r. 10*l.*, 725*l.*; i.g.r. of 40*l.*, Shirlock-rd., u.t. 82 yrs., g.r. 10*l.*, 675*l.*; 13, Sinclair-gardens, Kensington, f., r. 75*l.*, 755*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	9/0/0
Teak, E.I. ..load	10/0/0	18/0/0
Sequoia, U.S. ft. cu	1/10	2/2
Ash, Canada load	3/0/0	4/5/0
Birch, do.	3/0/0	4/5/0
Elm, do.	3/15/0	5/0/0
Fir, Dantsic, &c.	1/10/0	3/0/0
Oak, do.	2/15/0	4/15/0
Canada	5/5/0	6/15/0
Pine, Canada red	2/15/0	3/5/0
Do. Yellow ...	3/10/0	5/15/0
Lath, Dantsic, fath	4/10/0	5/10/0
St. Petersburg..	5/0/0	6/10/0
Wainscot, Riga, &c., log	2/15/0	5/0/0
Odessa, crown....	2/15/0	5/0/0
Deals, Finland 2nd & 1st std 100	7/0/0	9/0/0
Do. 4th & 3rd ..	7/0/0	8/0/0
Do. Riga	7/0/0	8/10/0
St. Petersburg, 1st yellow ...	9/10/0	12/0/0
Do. 2nd yellow	7/10/0	9/0/0
Do. white	8/0/0	10/10/0
Swedish	7/0/0	15/10/0
White Sea.....	6/10/0	14/0/0
Canada, Pine 1st	21/0/0	24/10/0
Do. do. 2nd.....	16/10/0	17/10/0
Do. do. 3rd, &c.	7/10/0	10/10/0
Do. Spruce, 1st..	8/10/0	10/0/0
Do. do. 3rd and 2nd	6/10/0	7/10/0
New Brunswick	6/0/0	7/0/0
Battens, all kinds	5/0/0	21/0/0
Flooring boards, sq., 1 in. prep. 1st.....	0/9/6	0/14/0
Do. 2nd	0/7/0	0/11/6
Other qualities—	0/5/0	0/7/0
Cedar, Cuba ..ft.	/3	/4
Honduras, &c.	/3	/4½
Mahogany, Cuba	/3	/6
St. Domingo, cargo av.	/3	1/6
Mexican do. do.	/3	/4
Tobasco do. do.	/3	/6
Honduras do..	/3½	/5½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio	7/0/0	18/0/0
Bahia	6/0/0	17/0/0
Satin, St. Domingo.....	0/0/5	0/1/0

TIMBER (*continued*).		
Satin, Porto Rico	0/0/6	0/1/6
Walnut, Italian....	0/0/3½	0/0/7

METALS.		
Iron—Pig, in Scotland .....ton	2/1/1	0/0/0
Bar, Welsh, in London	5/12/6	5/15/0
Do. do. at works in Wales.....	5/2/6	5/5/0
Do. Staffordshire, in London.....	6/0/0	6/10/0
COPPER—British cake and ingot	43/0/0	43/5/0
Best selected ..	43/10/0	44/0/0
Sheets, strong..	51/10/0	0/0/0
Chili bars	40/5/0	40/10/0
YELLOWMETAL lb	0/0/4½	0/0/4¾
LEAD—Pig, Spanish ....ton	9/12/6	9/13/0
English com. brands	9/13/9	9/15/0
Sheet, English, 6 lbs. per sq. ft. and upwards ..	10/15/0	11/0/0
Pipe	11/15/0	0/0/0
ZINC—English sheet .....ton	18/10/0	19/0/0
Vieille Montagne	19/10/0	0/0/0
TIN—Straits.....	60/17/6	61/7/6
Australian.....	61/0/0	61/10/0
English Ingots.	63/5/0	63/10/0
Banca.....	61/10/0	62/0/0
Billiton	60/10/0	61/0/0

OILS.		
Linseed .....ton	19/15/0	20/2/6
Cocoanut, Cochin	25/0/0	0/0/0
Do. Ceylon	23/0/0	0/0/0
Palm, Lagos	23/0/0	0/0/0
Rapeseed, English pale	22/0/0	0/0/0
Do. brown	20/10/0	0/0/0
Cottonseed ref. ..	17/5/0	18/10/0
Oleine.....	21/0/0	22/10/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	5/0/0	22/0/0
TAR—Stockholm barrel	1/1/0	0/0/0
Archangel.....	0/13/0	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

BEAUMARIS.—For additions, &c., to county school buildings for the Governing Body. Mr. Evan Thomas, Borough Surveyor, Beaumaris:—

Hugh Jones & Co.....	£328	Evan Parry, Menai Bridge *	£240
W. R. Jones.....	292	David Owen	228
Hugh Parry	285	William Jones.....	180
Watkin Jones	270		
R. Jones & Williams.....	268		

* Accepted.

CARRICK-ON-SUIR (Ireland).—For the erection of twenty-five labourers' cottages, for the Union Guardians. Mr. T. Beary, C.E. Quantities by engineer:—

James Nowlan, Timrakelly, Carrick-on-Suir, £113 17 6 each*

* For two cottages.

DOVER.—For the execution of street improvement works, Buckland-terrace, &c., for the Corporation. Quantities by Mr. W. Thomas, C.E., Borough Engineer:—

	Buckland-terrace.	Smith-road.	Cherry Tree-lane.
Austen & Lewis	£134 10 0	£209	£1,190 *
W. Johnson & Co.	192 0 0	347	1,605
H. Stiff	* 139 0 0	227	1,339
J. J. Hall	151 7 0	326	1,183
G. Lewis & Sons	130 0 0	* 200	1,970
G. T. Keeler	141 14 0	217	1,201

[All of Dover.]

* Accepted Tenders.

ENFIELD.—For sinking a shallow well and erecting tank-house at the baths, Bradley-road, for the Enfield Urban District Council. Mr. W. Ketteringham, Engineer, Court-house, Enfield:—

W. Gardner	£1,140	W. Lawrence	£1,028
The Constructional Iron Company	1,133	A. Fairhead & Son, Enfield (accepted).....	922

[Engineer's Estimate, £998.]

FARNBOROUGH (Hants).—For the erection of a police-station. Mr. James Robinson, County Surveyor, 13, Southgate-street, Winchester:—

		For cubicles.
B. Cooke & Co.....	£3,420 0 0	£49
Stephens, Bastow, & Co.	3,398 0 0	35
Claridge & Bloxham	3,108 0 0	28
W. Hughes	2,934 10 0	25
Musselwhite & Son	2,890 0 0	30
J. H. Corke.....	2,879 0 0	33
A. Tennant	2,878 0 7	28
G. Kemp	2,717 0 0	31
Pool & Son, Hartley Wintney *	2,650 0 0	29
T. Martin.....	2,330 0 0	28

* Accepted.

LEANNON (Carmarthenshire).—Accepted for the erection of a new school at The Tumble for the Leannon School Board. Mr. W. Griffiths, architect, Falcon Chambers, Llanelly. Quantities by the architect:—

Messrs. Peregrine & Mainwaring, Cross Hands, Llanelly £1,523

LLANELLY (Carmarthenshire).—For the erection of a new arcade at Llanelly for Mr. T. Griffiths, Luton House. Mr. William Griffiths, architect, Falcon Chambers, Llanelly. Quantities by architect:—

Thomas & Watkins	£4,376 16 6	H. Gibbon, Cardiff*	£3,659 0 0
D. Jenkins.....	4,000 0 0	W. Bassett	3,650 0 0
A. Berridge	3,987 0 0	Brown, Thomas, & John	3,598 15 0
Whissaman	3,900 0 0	T. Pugh Jones.....	3,585 0 0
Geo. Mercer	3,888 0 0	L. Monkton.....	3,580 0 0
D. C. Jones & Co...	3,785 0 0		

* Mr. Gibbon's amended tender accepted. Plate-glass windows not included in above tenders.

LLANELLY (Carmarthenshire).—For the erection of a new residence at Llanelly, for Mr. John Mead, New-road, Llanelly. Mr. Wm. Griffiths, architect, Falcon Chambers, Llanelly:—

W. Bassett	£1,585	G. Davies	£1,475
Brown, Thomas, & John..	1,574	T. Hughes	1,469
Jno. Thomas	1,480	Geo. Mercer, Llanelly* ..	1,420

* Accepted.

LLANELLY (Carmarthenshire).—For the erection of a new residence for Mr. S. Furtwengler, Coldstream-street, Llanelly. Mr. Wm. Griffiths, architect, Falcon Chambers, Llanelly:—

G. Mercer.....	£337 0 0	D. Phillips.....	£430 0 0
T. Hughes	525 0 0	Thomas & Hopkins, Llanelly *.....	384 10 0
Saml. Thomas.....	436 15 6		

* Accepted.

LLANELLY (Carmarthenshire).—For the erection of a new residence at Llanelly, for Mr. James Auckland, Stepney-st., Llanelly. Mr. Wm. Griffiths, architect, Falcon Chambers, Llanelly:—

Brown, Thomas, & John	£1,572	8	
Wm. Bassett	1,557	18	
Geo. Mercer	£1,270	0	
Griffith Davies, Llanelly (accepted)	1,130	0	

LLANELLY (Carmarthenshire).—For alterations to residence, for Mr. J. S. Tregoning, J.P., Llanelly. Mr. Wm. Griffiths, architect, Falcon Chambers, Llanelly:—

Jno. Evans	£737
Geo. Mercer, Llanelly (accepted)	698

LLANELLY (Carmarthenshire).—Accepted for erection of a new dwelling-house at West End, Llanelly, for Mrs. Cue, Mount Pleasant, Llanelly. Mr. Wm. Griffiths, architect, Falcon Chambers, Llanelly:—

Geo. Mercer, Llanelly	£300

LLANELLY (Carmarthenshire).—Accepted for the construction of a new bicycle track at Halfway, near Llanelly, for the Llanelly and County Cycling and Athletic Company, Limited. Mr. Wm. Griffiths, architect, Falcon-chambers, Llanelly:—

Henry Rees, Mina-street, Llanelly	£450

LLANELLY (Carmarthenshire).—Accepted for the erection of stable at Llanelly, for Mr. W. Knoyle, Stepney-street, Llanelly. Mr. Wm. Griffiths, architect, Falcon Chambers, Llanelly:—

John Evans, Erw, Llanelly	£120 10

LONDON.—For rebuilding the girls' and infants' offices in connexion with the Heber-road School, East Dulwich, for refitting the boys' offices and enlarging the urinal, for constructing new offices for teachers outside the school building, and providing a partly new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect:—

Holloway Bros.	£1,860	J. Marsland	£1,525
Lathey Bros.	1,783	J. Frampton	1,525
W. Downs	1,628	G. Newton	1,516
W. V. Goad	1,591	E. Triggs, Clapham *	1,495
L. Whitehead & Co.	1,569		

* Recommended for acceptance by the Works Committee.

LONDON.—For providing a system of heating apparatus for warming the new building in connexion with the St. Clement's-road School, Notting Hill, for the School Board for London:—

W. H. Wharton	£275	G. Davis	£198
The Wilson Engineering Co., Ltd.	264	Duffield & Co.	196
W. G. Cannon & Sons	220	Hendry & Pattisson	190
Z. D. Berry & Sons	218	J. C. & J. S. Ellis, Ltd., Sheffield *	187
Maguire & Son	215		

* Recommended for acceptance by the Works Committee.

LONDON.—For enlarging and refitting the boys' offices in connexion with the Mansford-street School, Old Bethnal Green-road, for refitting the girls' and infants' offices and constructing new water-closets for teachers, and for providing a partly new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect:—

G. Parker	£1,590	M. Calnan & Co.	£1,388
Harrison & Spooner	1,577	T. White & Son	1,329
E. Lawrance & Sons	1,559	F. G. Minter, Johnson-street, Westminster *	1,165
G. Newton	1,518		
J. Garrett & Son	1,480		

* Recommended for acceptance by the Works Committee.

LONDON.—Accepted for remodelling the lavatories and reconstructing the drainage to Devonshire House Property, for the Society of Friends. Messrs. Edward Saunders & Son, architects and surveyors, 6, Bishopsgate-street Without, E.C.:—

F. W. Milman	£1,119

LONDON.—For shop-front and fittings at 138 and 140, High street, Clapham, S.W., for Messrs. A. J. Palmer & Co. Mr. Alfred Howard, surveyor, 128, Adrian-terrace, South Kensington:—

W. Salter	£2,171	10	
E. Sage & Co.	1,665	0	
Young & Lonsdale	£1,471	0	
Powditch & Co.*	1,425	0	

* Accepted subject to modification.

LONDON.—For rebuilding the offices of all departments of the Gillespie-road School, Highbury Vale, and for providing a partly new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect:—

J. Groves & Son	£1,582	Vernall, Danes, & Co., Albany-street, N.W.*	£1,292
H. Knight & Son	1,571		
Stevens Bros.	1,462		

* Recommended for acceptance by the Works Committee.

LONDON.—For the erection of library buildings, Wandsworth Bridge-road, for the Fulham Free Library Commissioners. Messrs. Arthur Billing, Son, & Rowley, architects, Bank Chambers, Tooley-street, S.E.:—

Foster & Dicksee	£4,729	A. J. Thompson	£4,249
P. V. Wiadebank & Co.	4,693	J. O. Richardson	4,207
Leslie & Co.	4,596	A. Wallis	4,133
G. G. Wade	4,583	Scharian & Co.	4,084
R. A. Yerbury & Sons	4,500	J. W. Brooking	4,019
R. E. Williams & Sons	4,461	H. E. Tomes & Sons	3,936
J. P. Quick	4,449	Balsam. Bros.	3,890
F. T. Chinchen	4,388	H. Somerford & Sons	3,879
W. H. Smith	4,380	J. F. Collinson	3,706
J. Bullers	4,338		

LONDON.—For kerbing and tar-paving the footpaths and channelling and metalling the roadway of Blagdon-street, Lewisham, for the Lewisham Board of Works:—

Tuff & Miskin	£493 19 2

LONDON.—For kerbing, channelling, &c., Standard-road, Enfield Lock, for the Urban District Council. Mr. Richd. Collins, Road Surveyor, Court House, Enfield:—

Lagdon & Crawford	£1,280	W. Nichols	£841
J. Dixon	1,058	J. G. Betts	829
T. Adams	1,042	Lee & Son	797
Fry Bros.	887	John Jackson & Son, Enfield Town, N. *	770 14
W. Griffiths	863		

* Accepted.

LONDON.—For the execution of paving work, &c., Barnes-terrace, Greenwich, for the Board of Works. Mr. James R. Heward, Architect:—

W. Penfold	£292	Thomas Adams	£171
H. C. Burch	223	Fry Brothers	129
J. Mowlem & Co., Westminster (accepted)	191	10	

LONDON.—For the supply of 1,800 tons granite pitching for the Vestry of Mile End Old Town. Mr. J. M. Knight, Surveyor, Vestry Hall, Bancroft-road, Mile End-road, E.:—

	Per ton.		Per ton.
G. G. Rutty	£1 13 0	John Fyfe, Aberdeen*	£1 12 0
F. & A. Manuelle	1 12 5		

* Accepted.

MENSTON AND BURLEY (Yorks).—For the execution of the several works required in the construction of about 6,000 lineal yds. of cast-iron and earthenware pipe sewer, with the necessary valves, manholes, lampholes, &c., in the townships of Menston and Burley, for the Wharfedale Union Rural Sanitary Authority. Mr. John Waugh, C.E., Sunbridge Chambers, Bradford:—

S. Matthews	£6,935	W. Barrand	£5,320
A. Graham & Sons	6,797	J. Schofield, Sons, & Co.	5,246
W. Binns	6,612	J. E. Madin	5,098
A. Broxup & Son	5,847	J. & T. Young	5,000
G. Bell	5,688	Wm. Doleman	4,633
G. Pearson	5,630	D. Speight, Canal Basin, Leeds*	4,801
T. & M. Maston	5,450		
A. Braithwaite	5,388		

[Engineer's estimate, £4,828 4s. 2d.]

* Accepted.

PENRHIWCEIBER (S. Wales).—For the erection of forty houses, and making of new road, for the Tynte Building Club. Mr. S. Rooney, architect, 9, Quay-street, Cardiff:—

D. C. Jones & Co.	£8,231	Charles Jenkins & Son, Porth*	£6,000
T. Davies	7,890	Gilbert & Reeves	5,422
W. Lissaman, jun.	6,200		
Hy. Gibbon	6,120		

* Accepted.

PENZANCE.—For the construction of a sewer, Penrose and Trewartha-terrace. Mr. George H. Small, Borough Surveyor:—

W. H. Stephens	£225	0	0
J. Runnalls, jun., Penzance (accepted)	129	10	6

PONTYPRIDD.—Accepted for the erection of a schoolroom, Coedpenmaen. Mr. D. Gwyn, architect, 49, Merthyr-road, Pontypridd:—

D. Thomas, Coedpenmaen, Pontypridd	£345 9 7

SEVENOAKS.—For the erection of five fire-exit staircases and other work in connexion therewith, at the Sevenoaks Union Workhouse. Mr. T. Potter, architect, 49, London-road, Sevenoaks:—

G. Smith & Co.	£346	0	0
Merryweather & Sons, Ltd.	344	0	10
Moorwood, Sons, & Co.	339	0	0
T. Potter & Sons, Ltd.	337	0	0
J. & F. May	286	10	0
Constructional Ironworks Co., Ltd.	281	0	0
E. J. Raybould & Co.	270	0	0
Lion Foundry Co., Ld.	266	11	0
Blackwall Iron Co.	£240	0	0
St. Pancras Iron Co.	239	0	0
W. Coker	228	0	0
L. Faulkener & Sons.	226	3	10
R. Durtnell	225	0	0
H. Miller	223	5	0
J. Sibley	199	0	0
W. S. Freeman	196	0	0
J. F. Clarke & Sons	182	0	0

SKIBBEREEN (Co. Cork).—For the execution of water supply works, &c., for the Union Guardians. Mr. Richard W. Walsh, C.E., 10, South Frederick-street, Dublin:—

William Baird	£6,424	A. W. Smith	£5,600
T. J. Dixon	6,300	James Donoghue	5,429
J. Dempsey	6,037	E. A. Hickson	5,363
Michael Walsh	5,875	James White, Brade, Leap, Co. Cork*	5,175
R. W. Johnson	5,635		

*Accepted.

STAINES.—For proposed additions to the "Angel & Crown" Hotel, Staines, for Mr. F. T. Harris. Mr. W. Ralph Low, architect, Staines, and 10, Basinghall-street, E.C.:—

	Additions.	Quantities supplied.	General Repairs. No quantities.
G. Gray	£2,617	....	£735
T. Hiscock	2,549	....	—
J. Wheatley & Son	2,540	....	554
G. Reavell	2,395	....	635
J. Belch	2,263	....	420 *
G. Martin	1,990	....	410 †
J. King & Son	1,956	....	—

*Accepted for general repairs only. † Withdrawn.

SWANSEA.—For the erection of additions to the Training College. Mr. H. C. Portsmouth, architect, Fisher-street, Swansea. Quantities by the architect:—

David Jenkins	£690	0	0
Philip Jones & Son	680	10	0
George Jay	672	2	9
John Tucker	622	10	0
J. & F. Weaver	620	0	0
Thomas, Watkins, & Co., Lim.	£582	0	0
Thomas Richards	580	0	0
Bennett Bros.	570	0	0
John Goodridge *	560	0	0
Wm. Lane	487	10	0

* Accepted.
[All of Swansea.]

TRAWDEN (Lancs.)—For the execution of sewerage and sewage-disposal works (three contracts), for the Urban District Council. Mr. Wm. Dent, C.E., Railway-street, Nelson. Quantities by Engineer:—

Contract No. 1 (Pipes).

Cliff	£863	14	7½	Turton Moor Pipe Co.	640	6	8
Doulton	745	10	4	Lee	612	19	8
Whitaker	657	8	6	J. Duckett & Son, Ltd., Burnley*	654	18	4
Brooks & Pickup	655	16	9½				

Contract No. 2 (Pipe-laying, &c.).

Cooper	£2,625	7	10	Atkinson	£1,709	2	9
Wadge	1,986	10	6	Brigg	1,640	7	3
Balmforth	1,972	10	0	J. & M. Hawley, Colne*	1,578	5	6
Robinson	1,823	15	6				
Ellis	1,786	6	6				

Contract No. 3 (Outfall Works).

Diggle	£2,891	7	9	Atkinson	£1,991	9	10
Cooper	2,210	19	5	Wm. Brigg, 30, Stripley Fields-road, Frizinghall, Bradford*	1,812	6	6
Wadge	2,181	4	5½				
Hawleys	2,110	8	2				
Robinson	2,056	10	3				

* Accepted.

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TAUNTON.—For the erection of lecture-rooms, laboratory, &c. East-street; also repairing house, for the Governors of the Huish School. Mr. J. Houghton Spencer, architect, 8, Hammet-street, Taunton:—

	New Buildings.	Repairs.
J. Mountstephens	£1,690 0	£310 0
H. Phillips	1,530 0	292 0
S. Derham	1,480 0	256 0
J. Morse	1,414 0	256 10
F. W. Rowsell, Taunton	1,386 14	232 10*
G. H. Pollard, Taunton	1,370 0*	270 0

*Accepted.

WEST MOORS (Dorset).—For the erection of school buildings, for the Vicar of Verwood. Messrs. Adye & Adye, architects, Town Hall-chambers, Bradford-on-Avon:—

W. Griffin	£4,100	0	0
R. Elcock	3,692	10	0
D. Hitching	3,548	9	4
Haymond & Wooster, Bath (accepted)	3,159	0	0
A. E. Begwood & Co.	3,114	13	8
H. Barrow	£3,071	10	0
Jenkins & Sons	3,058	0	0
E. Linzey	2,990	0	0
Merrick & Son	2,969	10	0
W. E. Alexander	2,900	0	0

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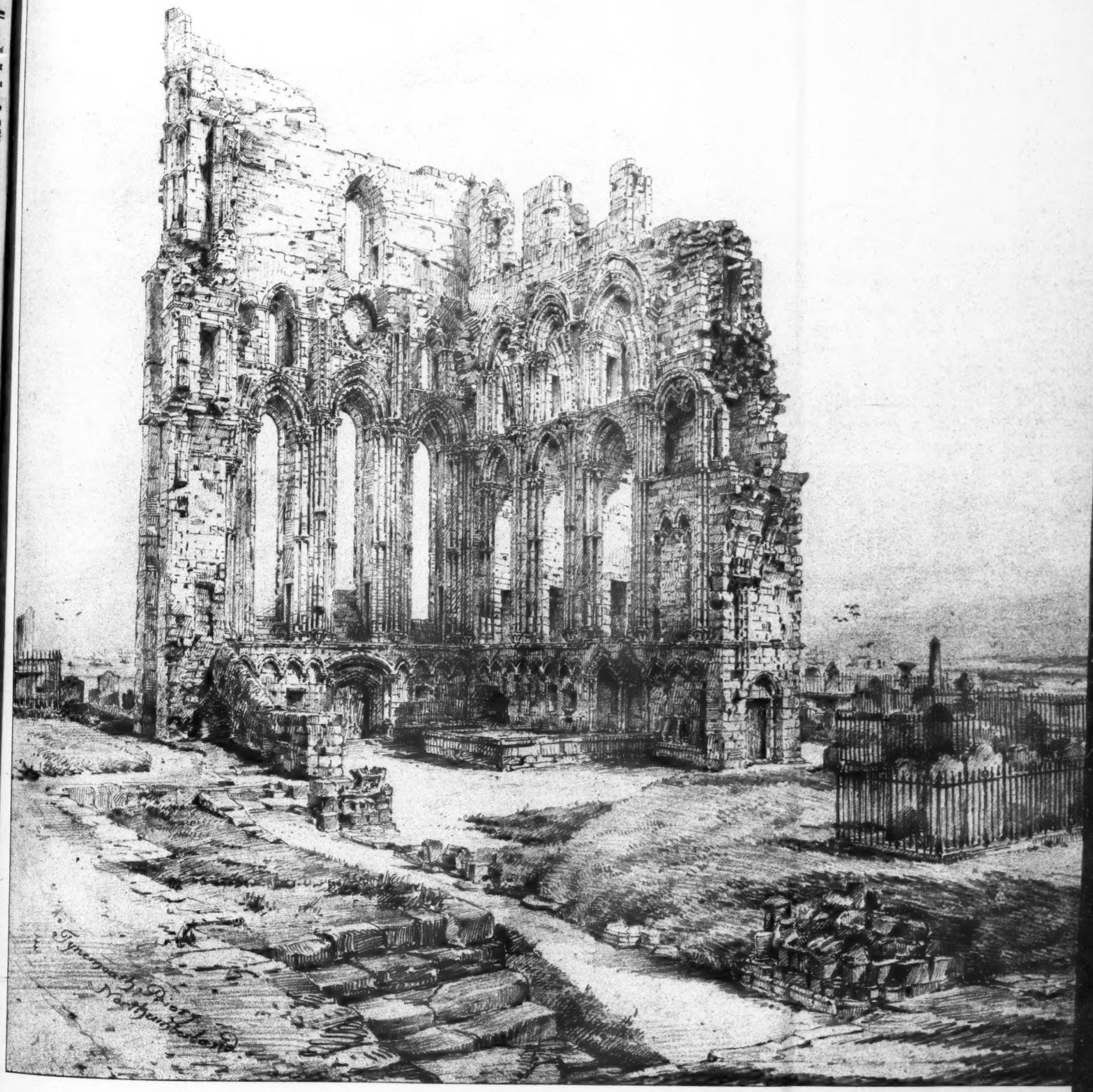

THE ABBEYS OF GREAT BRITAIN.—No. 9. TYNEMO

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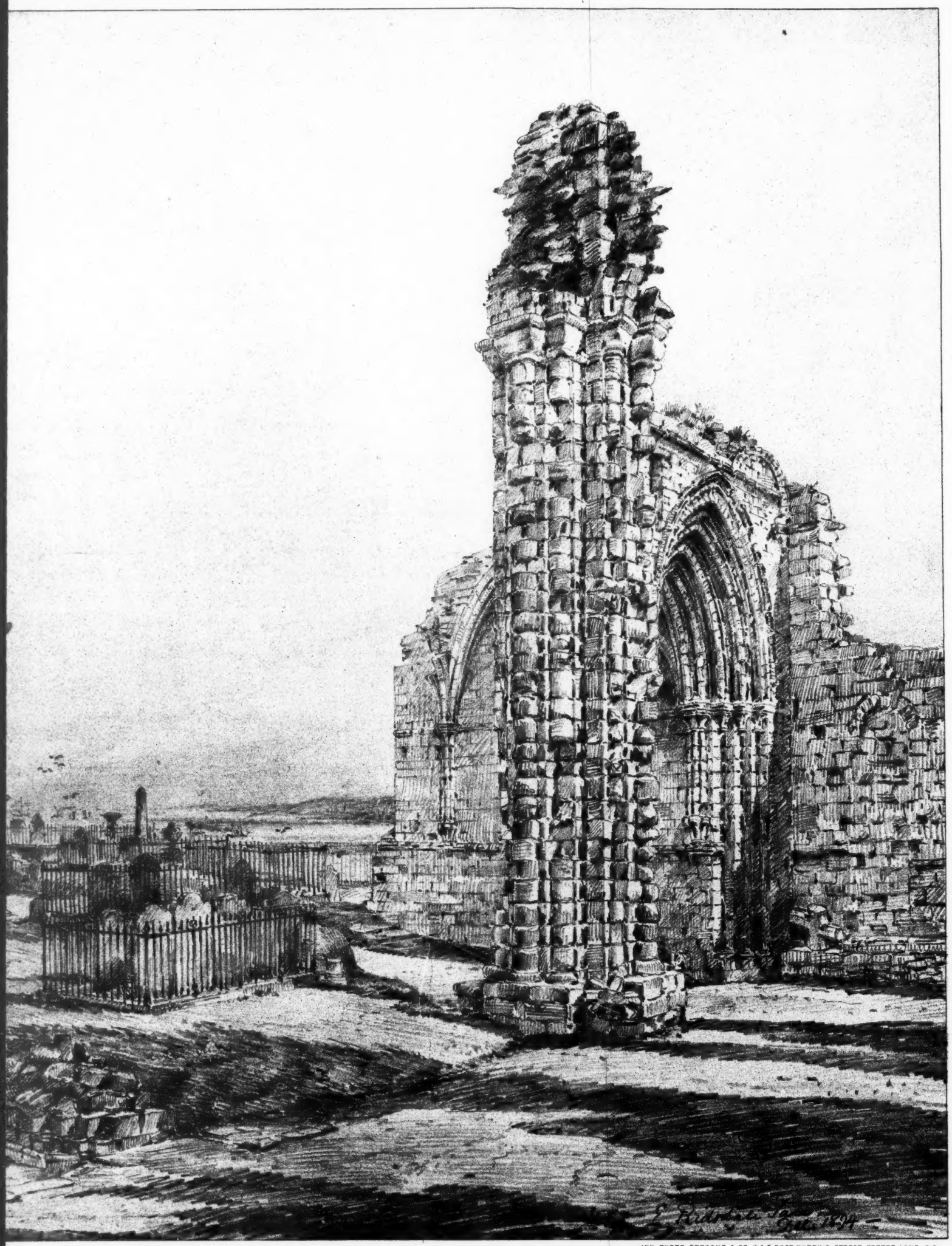

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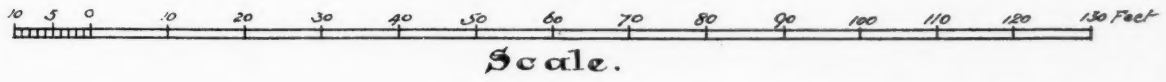
EAT BRITAIN.—No. 9. TYNEMOUTH.

BY MR. G. RIDSDALE TATE.

The Priory Church of St. Mary, Tynemouth, Northumberland.

Ground Plan.



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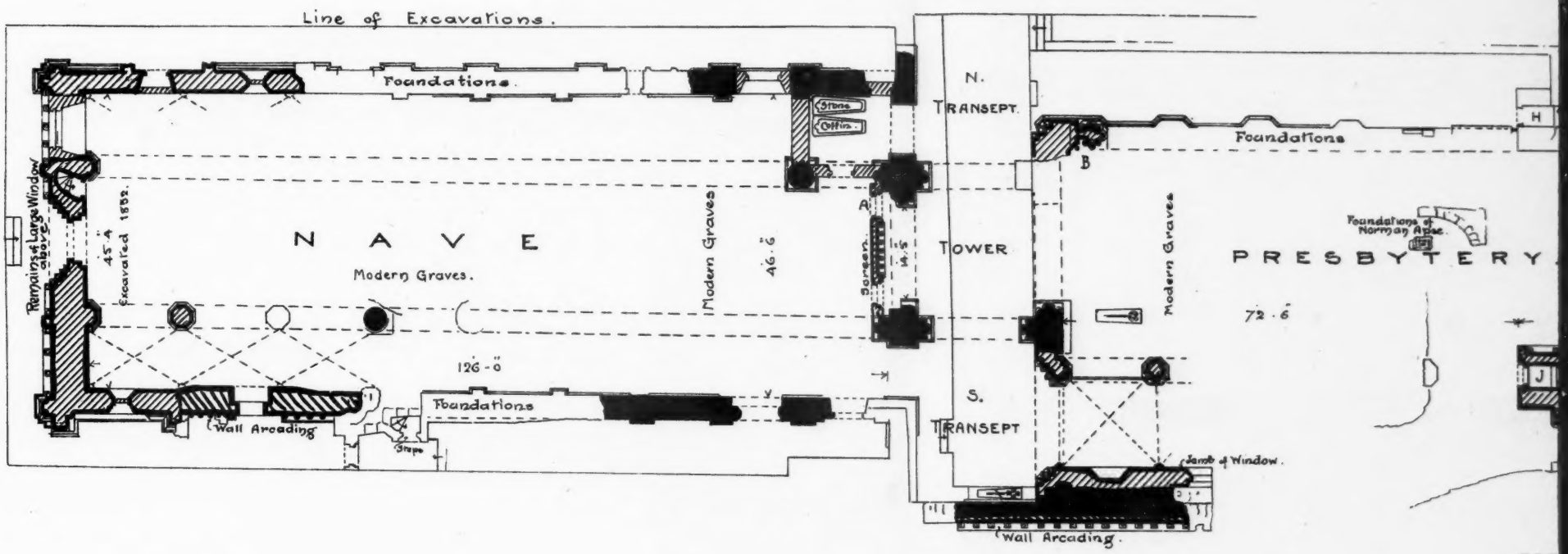
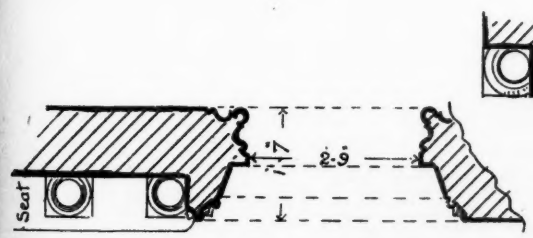
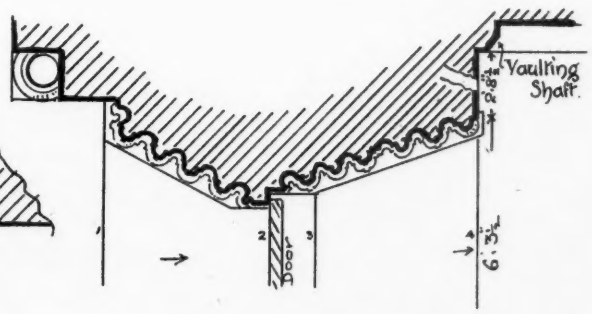




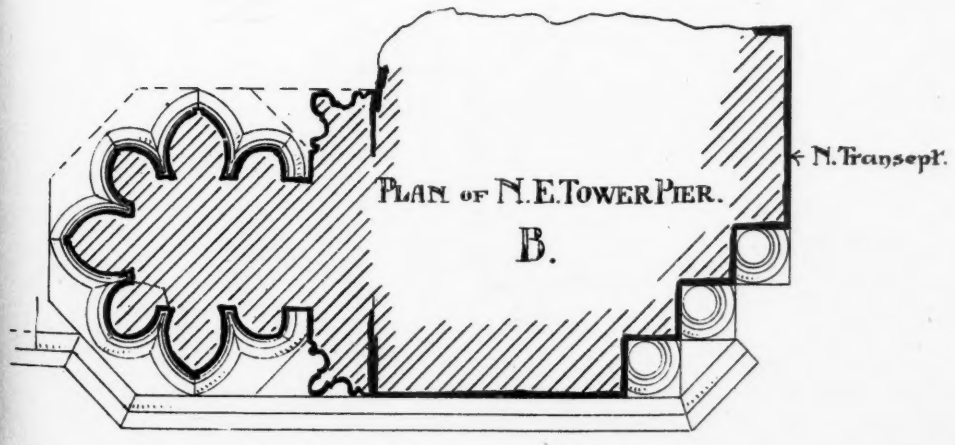
PLAN OF DOORWAY IN SCREEN.

A.



JAMB OF DOORWAY TO LADYE CHAPEL

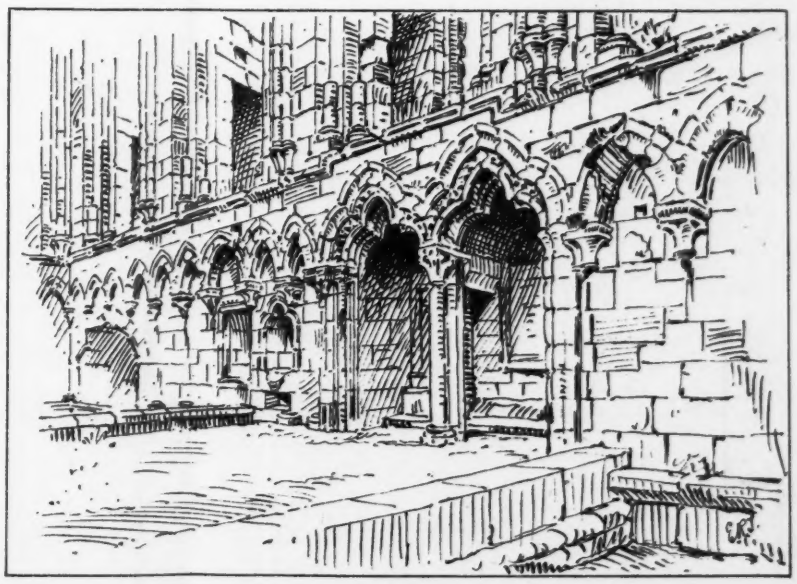
C.

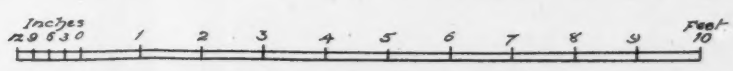


PLAN OF N.E. TOWER PIER.

B.

SEDILIA AND ARCADING. S. SIDE OF PRESBYTERY.





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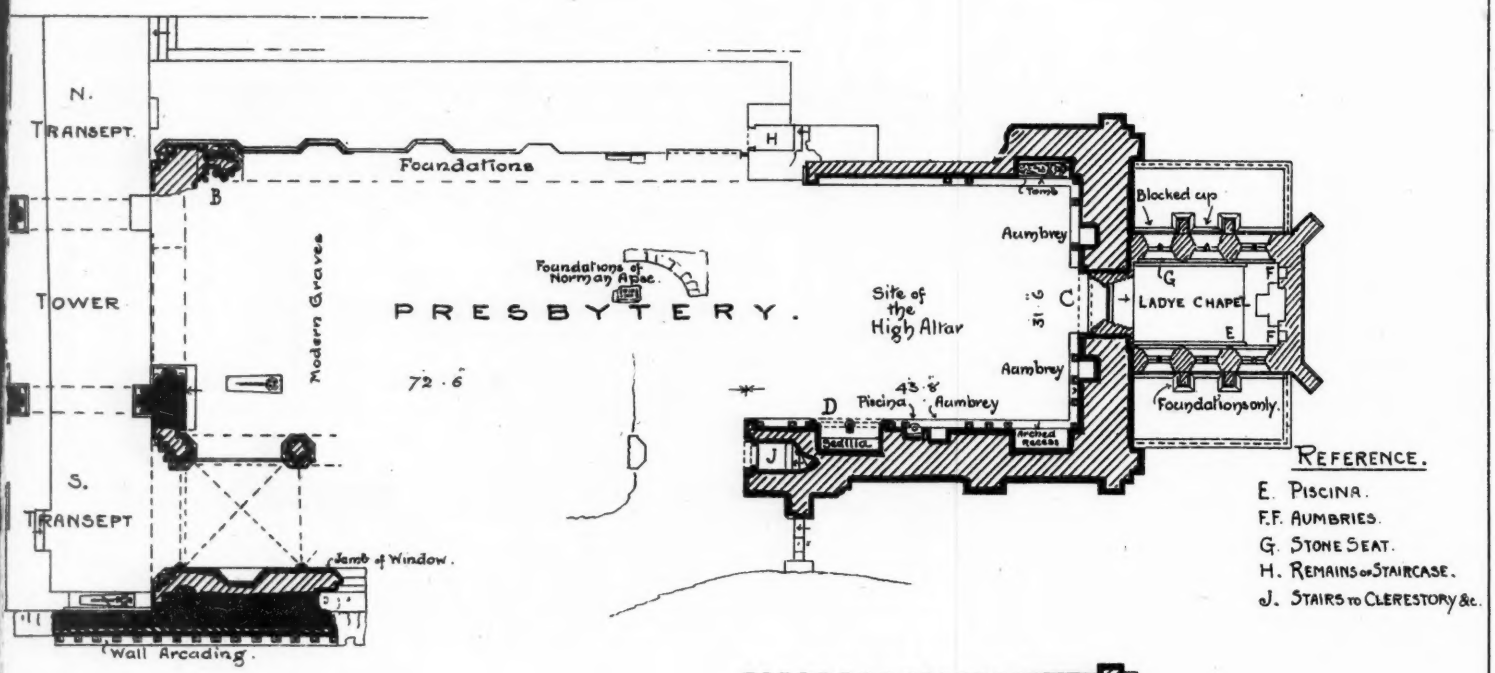

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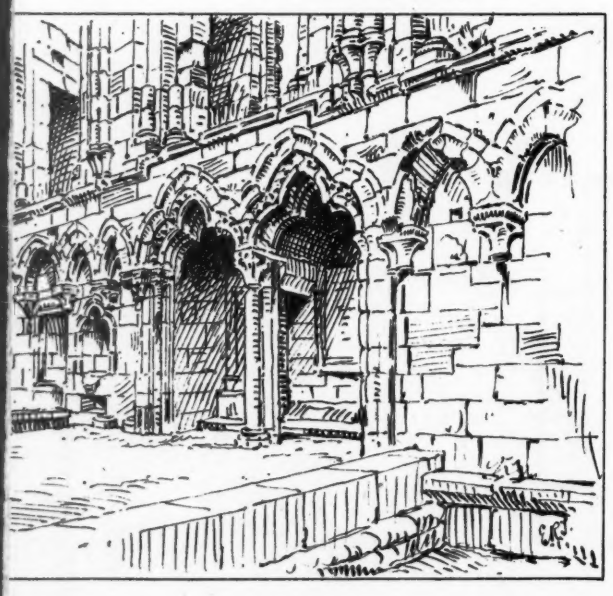

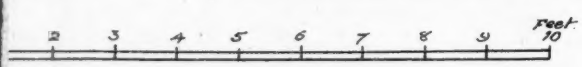

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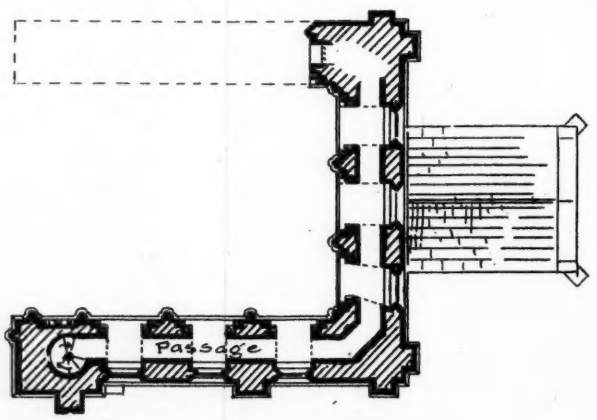
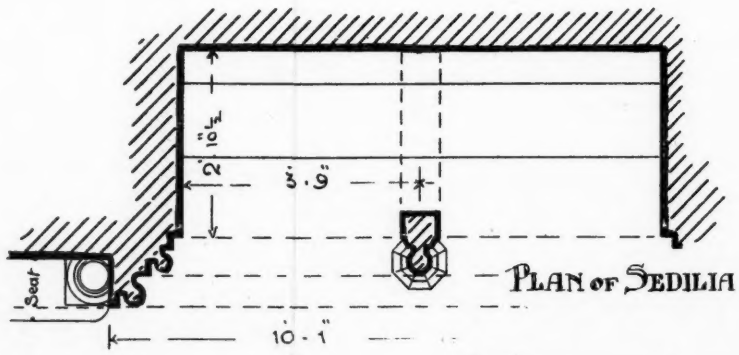


PLAN THRO' WINDOWS (FIRST STORY.)



PLAN OF SEDILIA.

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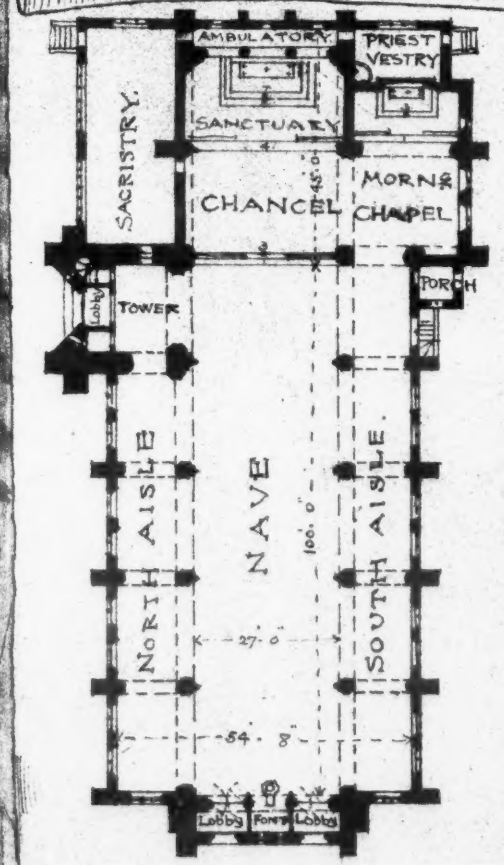

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NAVE	436.
NORTH AISLE	125.
SOUTH AISLE	189.
MORNING CHAPEL	59.
CHOIR.	46.
TOTAL.	855.

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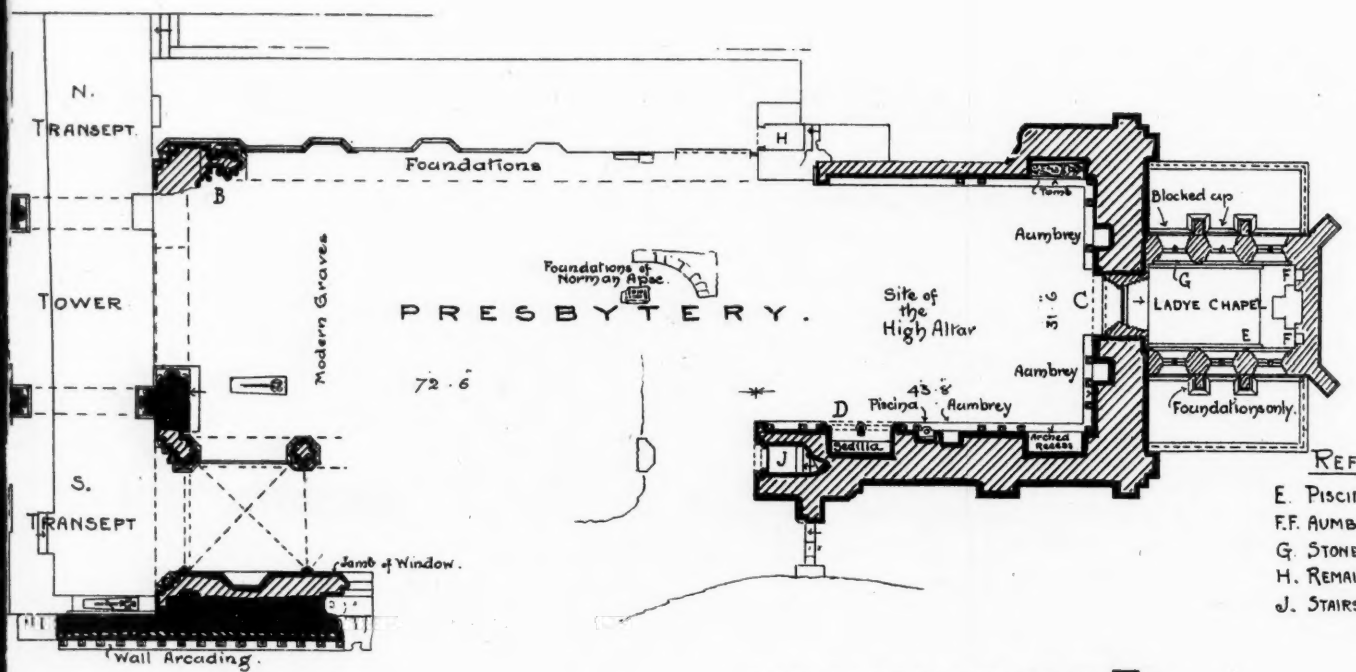
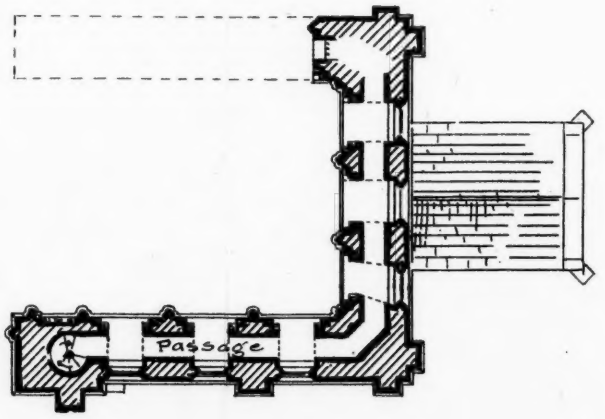
- SECOND Do.
- PERPENDICULAR.



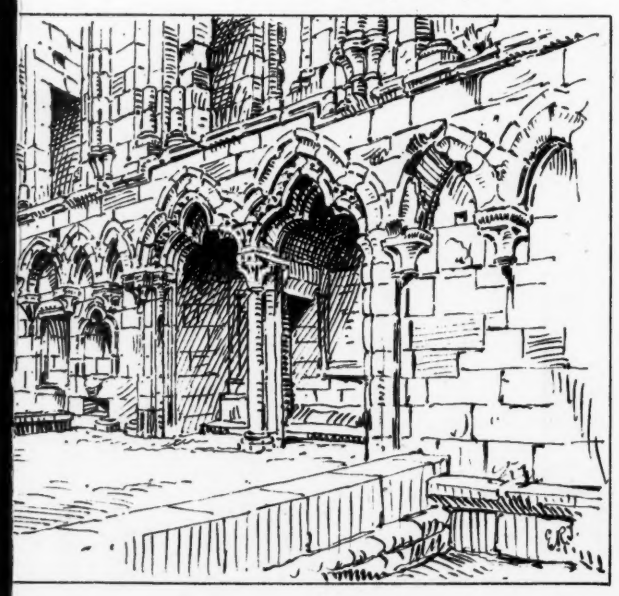
REFERENCE.

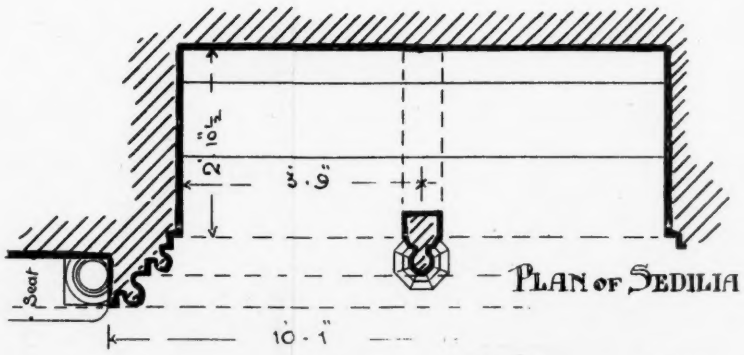
E. PISCINA.
F.F. AUMBRIES.
G. STONE SEAT.
H. REMAINS OF STAIRCASE.
J. STAIRS TO CLERESTORY &c.



PLAN THRO' WINDOWS (FIRST STORY.)

LIA AND ARCADING. S. SIDE OF PRESBYTERY.





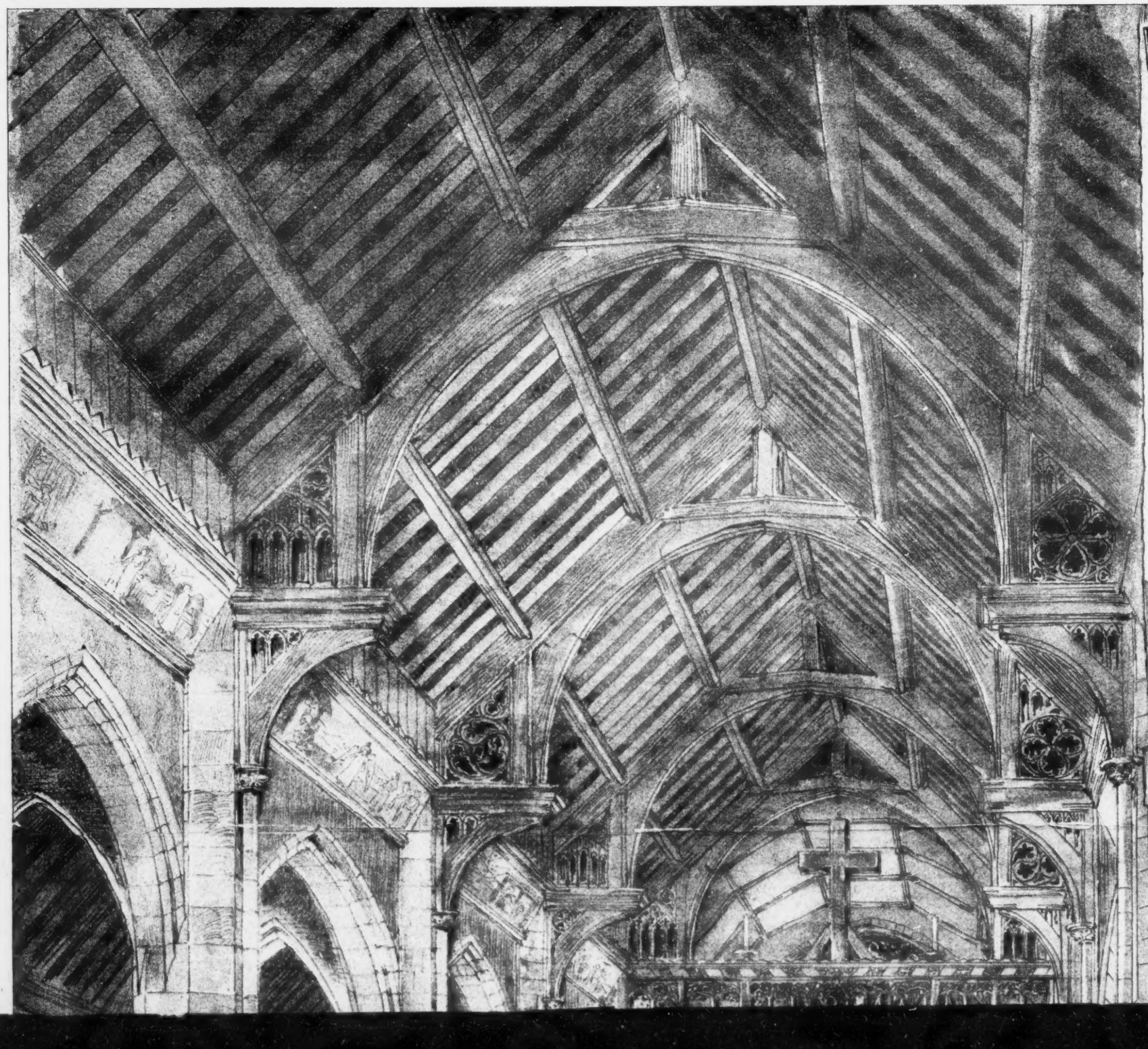
PLAN OF SEDILIA.

2 3 4 5 6 7 8 9 Feet 10

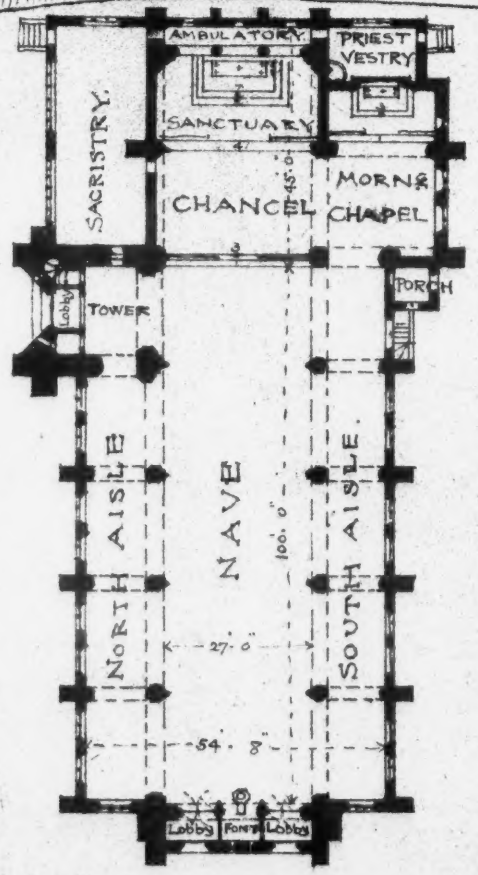
Scale for Details.

E. Ridsdale Sale
Mens et delt 1895.

PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.



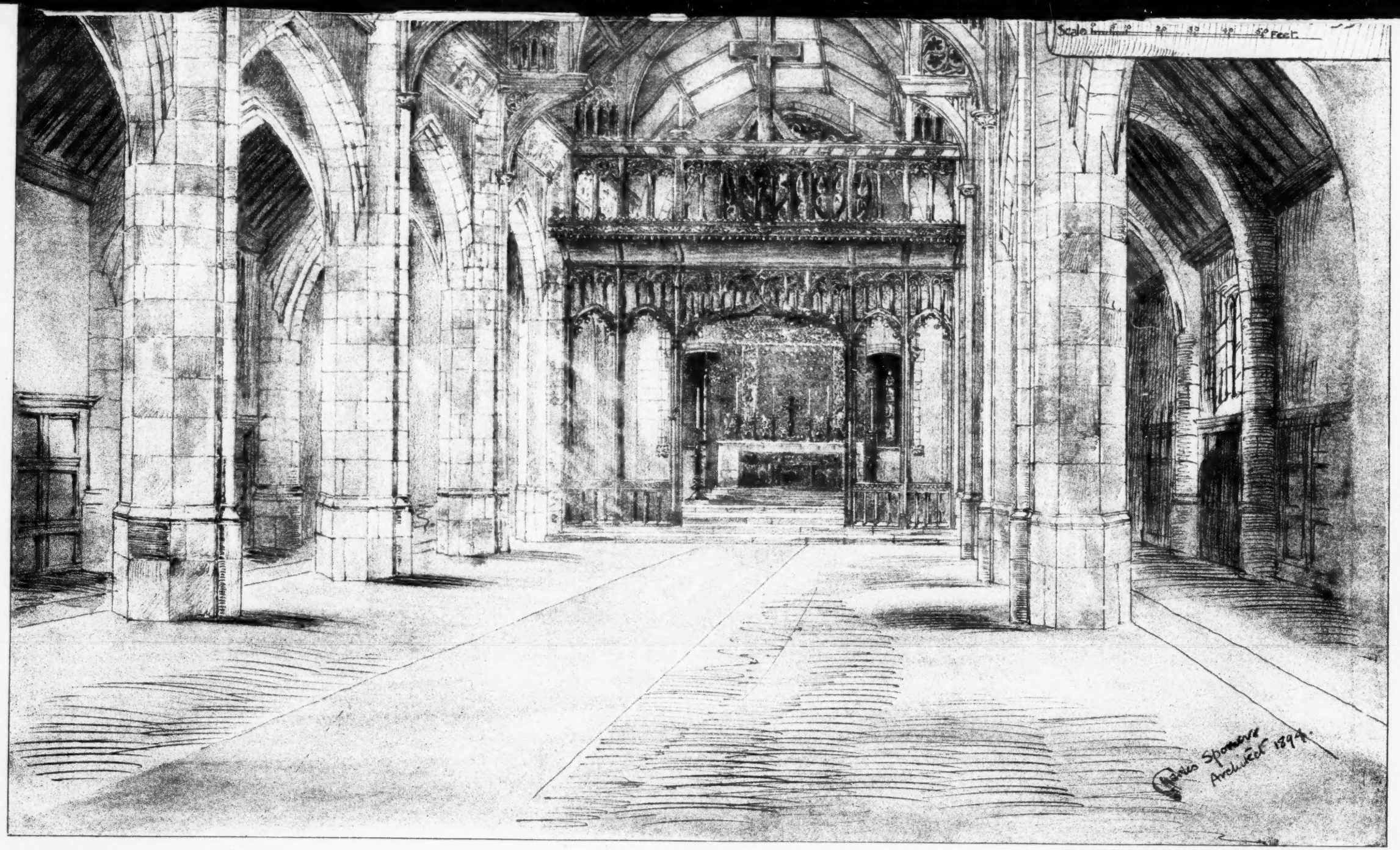
CHURCH OF St BARTHOLOMEW, IPSWICH.



ACCOMMODATION.

NAVE	436.
NORTH AISLE	125.
SOUTH AISLE	189.
MORNING CHAPEL	59.
CHOIR.	46.
TOTAL.	855.

Scale for plan 8 0 10 20 30 40 Feet.



INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PROPOSED NEW CHURCH OF ST. BARTHOLOMEW, IPSWICH.—Mr. Charles Spooner, Architect.

The Drapers

The Goldsmiths Company

INA PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

DESIGN FOR EAST WINDOW, CHURCH OF SS. SIMON AND JUDE, SOUTHPORT.—By Messrs. Shrigley & Hunt.